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A MAGAZINE FOR ARMOR ENTHUSIASTS

Volume 3 Number 9

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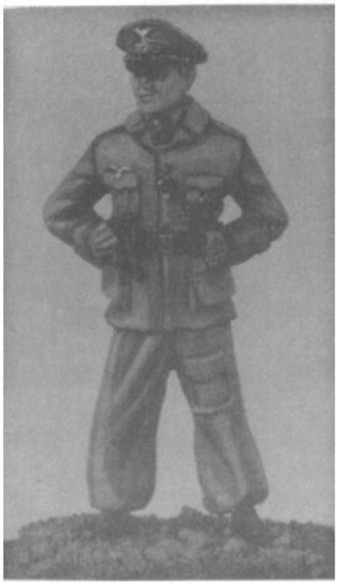

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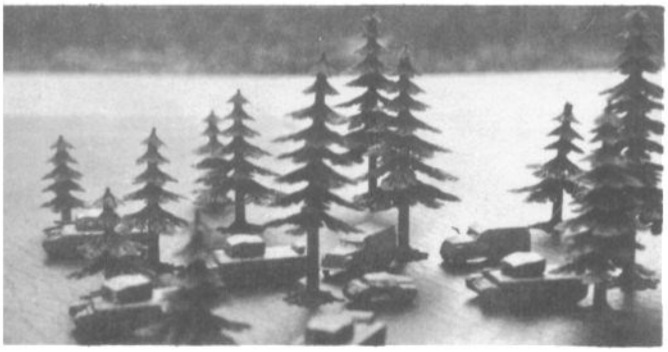

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Number 9 -1972

AFV-G2
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COVER: Under the curious eyes of the crew of a passing M-26 medium tank, an abandoned North Korean SU-76M waits for evaluation from UN intelligence. Our cover pen-and-ink rendering is the work of Lt. Dwight McLemore More on the SU-76 on Page 15.

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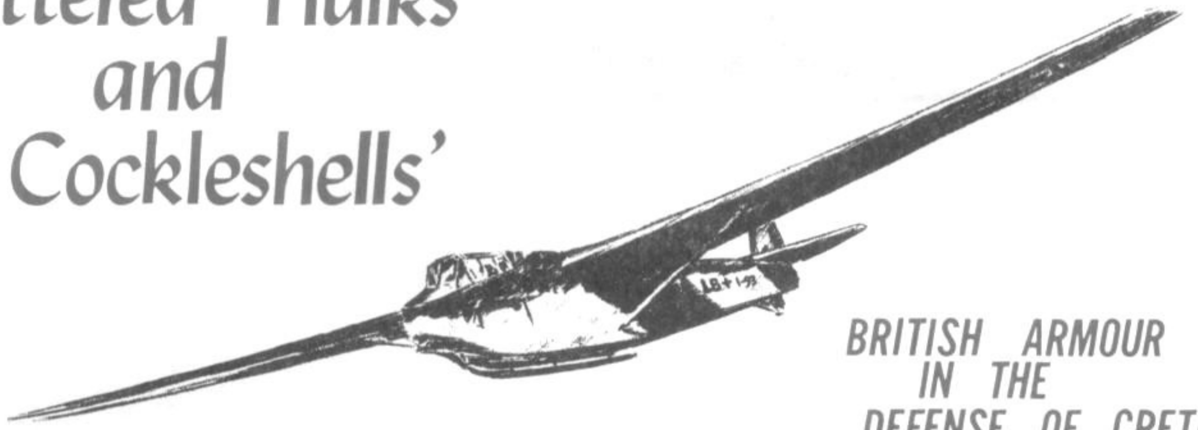
'Battered Hulks and Cockleshells'



BRITISH ARMOUR IN THE DEFENSE OF CRETE

Part Three

by William E. Platz

VI. Malamé; The Last Airfield.

"....Material promised has not come to hand...."

Brig. Hargest, CO, 5th Brigade

The western anchor of the British forces on Crete was the landing ground at Malamé, located 11 miles west of the capitol of Canea, and some 15 miles from the docks at Suda Bay. Like the other two landing strips on Crete, Retimo and Heráklion, Malamé was situated on the narrow coastal strip with the sea to the north and high ground within small arms range to the south. Just west of the field was the bed of the Tavronitis River which divided into two channels as it made its way to the sea. As a result, a 400 yard wide bed some 12 feet below the level of the surrounding countryside was formed through which ran the shallow streams. About three-quarters of a mile from the mouth of the river, a steel girder bridge, supported by stone pylons, spanned the entire river bed. Across this ran the main east-west road which then continued along the southern edge of the airfield on through the villages of Pirgos and Plantanias eastwards to Canea.

The defense of the Malamé sector was the responsibility of the 5th New Zealand Infantry Brigade under Brigadier James Hargest, a gentleman farmer and Member of Parliament who had acquired a good military reputation during the First World War. The 5th Brigade was one of the stronger formations evacuated from Greece and now consisted of the 21st, 22nd, 23rd and 28th New Zealand Infantry Battalions, all understrength and short of heavy weapons, and a 364-man detachment from the Divisional Engineers armed as infantry. In support of Hargest were 7 of the elderly 75mm guns, two 3.7-inch mountain howitzers and 10 Bofors AA guns, and the customary pair of Matilda Infantry Tanks for the defense of the airfield.

At first glance this force would seem more than adequate for the defense of the landing ground; however, the airfield was not Hargest's only worry. The 5th Brigade was also responsible for a dozen miles of coastline and attack from the sea had been stressed nearly as much as attack from the air. Dispositions were made accordingly and only one Battalion - the 22nd - was available for close defense of Malamé itself, although two others were positioned within two miles.

On May 14th, 1941, two Matildas from Captain Badrock's detachment of "B" Squadron, 7th RTR clattered out of Suda and along the coast road to Malamé. About a quarter of a mile east of the runway, the tanks turned off onto a secondary track running southwest behind the 300 foot high Hill 107. Here they found the carefully camouflaged revetments where they were to wait for the German onslaught.

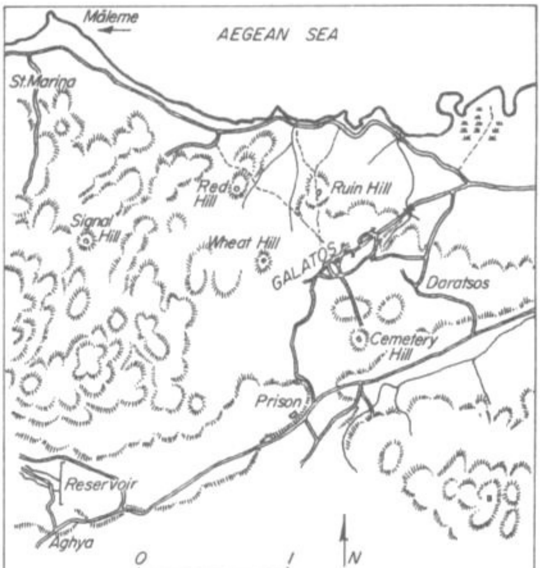
VII. Final Preparations at Force Reserve

"C" Squadron of the 3rd Hussars had not had their spirits dampened by their initial reception on the island, and during the night of 18-19 May, the main body - 7 Mark VI. Light Tanks - inched their way along a goat track towards the coast road. Behind them, another ship in Suda Bay exploded showering the countryside with burning embers, and filling the northern sky with a reddish glow. Early on the morning of the 19th, the Squadron arrived at its assigned position where the Galatos Road branched from the main east-west artery. Here they formed part of Force Reserve, along with the 4th New Zealand Brigade; and, in fact, their seven tanks represented the most powerful striking force in Western Crete.

Tuesday morning, May 20, 1941, 0700 hours. At the Galatos Turn, breakfast was being served when the air suddenly filled with diving aircraft. Me. 109's swarming at tree-top level scattered machine gun fire among the olive groves, and JU-87's, their wing sirens wailing, littered the landscape with an occassional bomb. As the Hussars dove for cover, parachutes erupted to the west and the south of their position.

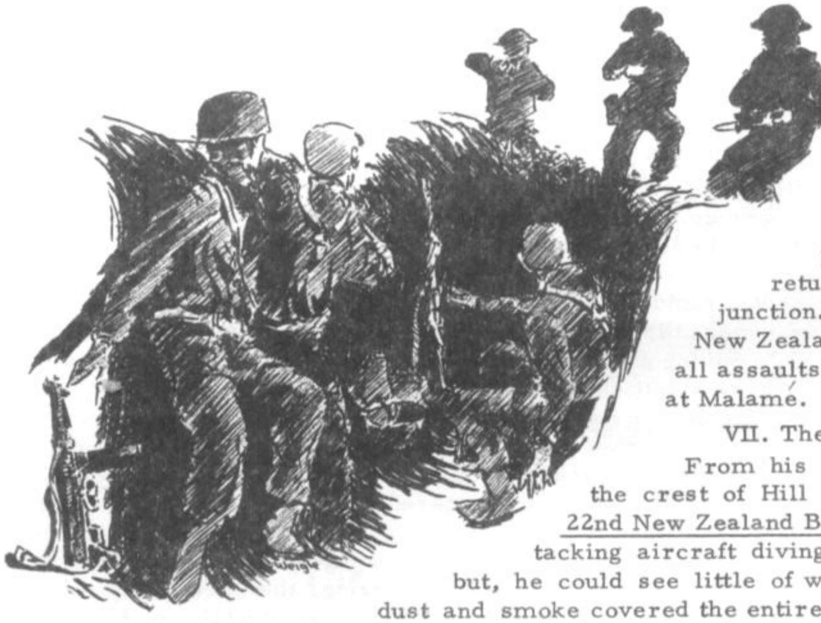
The response of the Hussars was rapid, if not particularly effective. Lt. Roy Farran with the three Mark VI. Lights of his Troop moved to the sound of the guns (or perhaps more correctly towards the flutter of the parachutes), arriving at the town of Galatos. Here they were greeted by a mass of Greek irregulars searching for ammunition. A few hundred yards beyond the town, they passed through the lines of the 10th New Zealand Brigade. The Kiwis, encouraged by advancing armour, raised their thumbs in friendly salute. Farran was now in hostile country, moving along the road that leads down from the Galatos Heights to a broad valley where the main body of Oberst (or Colonel) Heidrich's Fallschirmjäger-Regiment 3. had been scattered. Olive groves grew close to the road, and among them shadows dodged from tree to tree. Vickers guns clattered and the shadows fell. Dead or taking cover? There was no way of knowing. Then a sickening lurch followed by a rattling clatter that screamed "Thrown Track"! With the other tanks covering, the crew of the stricken vehicle frantically worked to repair the damage. Anxious moments passed while the track was replaced and it became apparent that there was little prospect for the unsupported tanks to continue. The repairs completed, Farran retired to the New Zealanders' lines.

Meanwhile, at Force Reserve Headquarters near Canea, fatal decisions were being made. At 1040 hours, Colonel Kippenberger commanding the 10th New Zealand Brigade had requested higher authority for the infantry to launch a counterattack. His own troops were a motley collection of truck drivers and supply clerks, leavened by dismounted troopers of the Divisional Cavalry and two semi-trained Greek battalions, and they were totally unsuitable for offensive action. However, just behind Kippenberger's position were the three crack battalions of the 4th New Zealand Brigade and the seven light tanks of the 3rd Hussars. This powerful force was being held in reserve and its commander, Brigadier Inglis, soon saw his opportunity developing. The German attack in the central sector was delivered by the battalions of Fallschirmjäger-Regiment 3. and the Fallschirm-Pionier-Bataillon. These were to be landed in the broad valley south of Canea with detachments assigned to certain key points near the harbour and the capitol itself. The drop was only partially successful. Two battalions, I. and II. Abteilungen, landed in or near their intended areas; however, Major Heilmann's III. Abteilung was scattered over the area of Force Reserve and were virtually wiped-out within a few minutes. The Pionier-Bataillon landed in the cactus covered southwestern end of the valley. To add to their discomfort, the Pioniers were immediately set upon by 900 Greeks and a substantial number of Cretan civilians who engaged the paratroopers in a race for their weapons containers, with the losers getting a burst from a Schmeisser machine-pistol.



VICINITY OF GALATOS, CRETE

Against the two German battalions, which were rallying at a stone prison complex in the center of the valley, Inglis planned to launch his 4th Brigade with the seven tanks and as many Bren carriers as he could muster. Having driven the Germans from the valley, Inglis would then turn northwest arriving on the flank of the Germans attacking Malame. Had this plan been completed, the battle for Crete would have been over. It was not. As the plan passed up and down the chain-of-command, concern for maintaining an adequate reserve overrode the need for immediate counterattack, and so, at 2030 hours, only two infantry companies and three Mark VI. Light tanks, again under Lt. Farran, moved out of Galatos into the dusk. A short distance south of the town,



the tanks ran into a road block but no serious resistance was offered and by dawn, Farran's three tanks had reached the olive groves just north of the prison complex. Without hope of further support, however, the attackers were withdrawn to the previous line and Farran's tanks returned to their positions at the road junction. For the next several days, the New Zealanders would hold this line against all assaults while a decision was being reach-at Malamé.

VII. The Battle of Tavronitis Bridge

From his command post in a hollow behind the crest of Hill 107, Lieut. Col. Andrews of the 22nd New Zealand Battalion could hear the road of attacking aircraft diving on his positions near the airfield; but, he could see little of what was happening. A vast cloud of dust and smoke covered the entire area, while bursting bombs added to the confusion by cutting telephone lines. In the tumult, the silent approach of the gliders of I. Abteilung, Sturm-Regiment was almost unnoticed. These troops were there to silence the Bofors guns, take the high ground of Hill 107, and capture the road bridge across the Tavronitis before the main body of the Sturm-Regiment landed by parachute. The glider assault was a disaster. Leutnant von Plessen's company came in low over the sandy beach near the river mouth. Their landing approach was made from inland in order to provide some cover from the AA guns but this tactic was of little avail. The gunners, pounded mercilessly for days by the Luftwaffe, now were presented with the chance to hit back. Pointers, hands gripping the traversing cranks, followed the descending aircraft slowly turning their guns on the platforms. Sitting on the opposite side of the mount, the trainers lowered the barrels until the target sat in the middle of their ring sight. The pointer then added a bit of lead and stepped hard with his right foot on the trigger, holding it down. A steady stream of high explosive tracers leaped out of the flaring flash hider while the brass cartridge casings flew from the bottom of the breech-block into the curved chute that carried them past the gunners and dropped them in front of the gun. Standing on the turning platform, the loaders kept the flow of four-round clips into the magazines continuous. The German aircraft were exposed for only a few minutes but in that time they were slashed by 40mm fire. One exploded in mid-air; another, making its final run, headed straight for a gun pit. The gunners followed it in, the elevating gears running into the stops as the glider landed and skidded across the ground. None of its passengers were left to clamber out. Leutnant von Plessen was killed and the survivors of his detachment made their way westward to find shelter in the river banks.

Hauptmann (Captain) Koch, with the Stabs-Kompanie, I. Abteilung, landed on the western slopes of Hill 107 and was immediately greeted by intense fire from "A" Company of the 22nd New Zealand Battalion. The casualties were heavy as unseen ridges smashed many of the 16 gliders as they landed. Koch was fatally wounded and the survivors were driven back. The medical officer, Oberstabsartz Dr. Neumann, now took command of the I. Abteilung which was scattered and reduced virtually to sniper parties.

In the dry bed of the river, the advanced Headquarters of the Sturm-Regiment under Major Braun landed in 9 gliders. While still airborne, however, the aircraft were raked with fire from the Bren guns of "D" Company of the 22nd. Major Braun was killed during the landing but a small group of Germans were able to work their way downstream and capture the eastern end of the bridge. They were stopped at the edge of the airfield by "C" Company but managed to hold onto their gains until help arrived.

Fifteen minutes after the glider attack, the main body of the Sturm-Regiment arrived in JU-52's. This force consisted of the II. and IV. (Schwere) Abteilungen to be dropped in the area west of the river, and the III. Abteilung which would land east of the village of Pirgos. These two groups would then converge on the airfield, but the plan was doomed from the start. Major Scherber's III. Abteilung was badly scattered along the coastal strip occupied by the 23rd and 28th (Maori) Battalions and the New Zealand Engineer Detachment. It was wiped out in minutes. The II. and IV. Abteilungen, however, achieved something that few German units on Crete were able to do - they landed unopposed behind a screen of dust and smoke - and from their drop zones these troops now moved up to the support of the remnants of the I. Abteilung in the river bank. Meanwhile, at the New Zealand command post on Hill 107, the situation remained unclear. All contact with the outlying companies had been lost when the telephones were cut during the preliminary air attacks. Now visibility was reduced to nil by the dust and the German landing west of the river went unnoticed. Throughout the afternoon pressure continued to mount from the unseen reinforcements and all attempts to arrange a counterattack by the rest of the 5th Brigade proved unsuccessful. With no further prospect of support, at 1715 hours Andrews committed his only reserves - the two Matildas - in an attempt to regain control of the bridge and the river bank.

The tanks had been positioned behind Hill 107, dug-in among a grove of almond trees. Here they had remained concealed and untouched throughout the day. Now they moved out down to the road and then westwards towards the bridge. The two tanks were in line separated by about 30 yards and were immediately peppered with small arms fire from isolated groups of parachutists. To support the tanks, 26 men came forward, two sections from Captain Campbell's "D" Company and 6 gunners from the Bofors detachment. More men were not available and the small force set out in a skirmish line south of the road on a level with the second Matilda tank.

The appearance of British armour had an unsettling effect on the Germans. "PANZER VON OSTEN!" sounded along the river, and here and there hard-pressed paratroopers "jumped up and ran back". A 2cm Flak gun was brought into action; it was ineffective. But within a few minutes, things began to go awry. The second Matilda discovered a defective breech-block on its two pounder. Shells would not fit in and the turret traversing gears did not work properly. The crew struggled with it for a few minutes without result and finally the tank turned back. The lead Matilda continued on, however, and the infantry and gunners sprinted ahead to catch up with it, but they were pinned down by enemy machine gun fire.

As the tank neared the bridge, it turned off the road and went down the embankmant into the river bed. Here it enfiladed the entire German line and the guns blazed away at the plentiful targets. Then, turning downstream, the tank moved towards the bridge. The Germans dodged behind the thick stone pylons as the Matilda passed between, crushing a mortar position beneath its tracks and spewing bullets in all directions (today the bridge pylons are still pock-marked from this firing). Past the bridge the tank ran into soft ground strewn with boulders, and after some 200 yards the Matilda "bellied out" - hopelessly bogged. Its turret now jammed, and, unable to either move or fire, the crew abandoned their vehicle.

With the failure of this counterattack, Lt. Col. Andrews decided to withdraw from Hill 107 and the airfield. He fell back to the positions of the 21st and 23rd Battalions; thus giving the Germans posession of Malamé and the Gateway to Crete. The two Matildas were recovered by the Germans and were later used to clear wreckage from the airfield runways.

IX. Two Counterattacks

The loss of Malamé airfield called for immediate action but it was not until 0100 hours on

- Continued on Page 27 -

COLOR 'N CAMOUFLAGE

Supplement : *The M-4A3E8 in Korea*

In AFV-G2, Volume 3, Number 4, the regular Color 'n Camouflage article covered a M-4A3E8 Sherman tank of "C"Company, 72nd Tank Battalion during the Korean War. In the article, we illustrated a "ribbon bar" that appeared on the right side of the tank's turret, just forward of the turret numbers "22". This ribbon bar consisted of segments that were similar to flags, each illustrating a country that was supported by the 72nd Tank Battalion during the Korean conflict. One of the segments illuatrated a "...dark blue flag with a white rooster..." which could not, at the time, be identified. Other segments identified the French, Dutch, Turkish and South Korean units that were a part of the United Nations forces in Korea.

With the help of Mr. Simon Dunstan of London, England, the mysterious "blue flag/white rooster" emblem has been identified. Mr. Dunstan wrote us a most interesting letter which provides information on a somewhat obscure part of the Korean War (at least from American sources).

Mr. Dunstan's letter (in part) reads:

"The "rooster" badge on the ribbon bar would, with little doubt, have been the insignia of the British 40th Division. The first British formation to go to Korea was the 27th Infantry Brigade (known as the 27th British Commonwealth Brigade) which was composed of the 1st Battalion Middlesex Regiment, 1st Battalion Argyll and Sutherland Highlanders and the 32nd Australian Infantry Battalion. The Brigade was drawn from the 40th Division in Hong Kong and served in Korea during late 1950, having as its sign the yellow cock with red comb, beak and legs set on a royal blue square of the 40th Division."

"It would seem logical that as the British had no armour until January 1951 that the 72nd Tank Battalion could have supported the 27th British Commonwealth Brigade. This unit was replaced by the 1st Commonwealth Division, whose armour content was the 8th King's Royal Irish Hussars and a Squadron of Lord Strathcona's Horse."

Much of the reference material for the M-4A3E8 article was drawn from the U.S. 2nd Infantry Division's unit history of the Korean conflict, "Second to None". This source does give some information as to support rendered to the French Battalion and the Dutch Battalion during part of 1950, however, nothing is mentioned as far as specific support for the British Brigade. We would be very interested to hear from readers with information on armor support rendered to formations other than U.S., in Korea during 1950-51.

EDITOR'S NOTE: We have recently received a sample copy of a most interesting modeling magazine from Japan. This is the "Tamiya News" published by the Tamiya Mokei Plastic Model Company of Shizuoka-City, Japan. Although the price of the magazine is not evident, it contains much information for armor enthusiasts. Our sample copy was dated March 1972, and contains six very interesting photographs of the Sd.Kfz.7 halftrack, and an article on a conversion of the Tamiya Panzer III. to the early amphibious version that was to be used in Operation "Sealion". Although the magazine is in Japanese, the drawings and photographs are very clear and detailed. We will attempt to find a retailer and the price for this interesting publication; reader help would be appreciated.

EDITOR'S NOTE: As a good many of our readers have commented, there were two continuations inadvertantly left out of last issue; these were to have appeared on page 30......Well, all I can say is that the "Gremlins" have struck again. We are printing the continuations in this issue; please refer to the Table of Contents for the location in this issue.

EDITOR'S NOTE: A note from Dan Post of Post-Era Publications indicates that his next book is at the printers and should be ready for delivery in six weeks (or so). The newest book will be a reprint of the U.S. Army manual (TM-E9-803) on the captured German Volkswagen Kübelwagen (Type 82), a very rare publication. For more details, contact Post-Era Motor Books, Arcadia, CA 91006

BEHIND THE ARMOR VERSUS SHOT CONFRONTATION

by Mark Diehl

In my previous article, developments leading to great improvements in armor quality were presented. The objective of armor research was production of metals having high degrees of both hardness and impact strength. The resulting face hardened alloy had almost twice the protective ability of ordinary steel armor. In this article, the advances in armor penetration will similarly be presented to the reader.

Faced with the onslaught of armored vehicles in World War I., weapons research soon found a suitable means for armor penetration by using a hardened steel projectile. From its similarity to the solid shot of smooth-bore days, the projectile was named Armor-Piercing Shot - usually written A/P Shot or AP Shot. Its two basic forms are cross-sectioned in Figure I. below.

The general shape of AP Shot is designed for armor penetration. Consequently, its ballistic action leaves something to be desired. By adding a Ballistic Cap, a more streamlined projectile is produced. Note, because hardened steel would destroy the bore of the gun, a soft-tempered copper sleeve, called a Rotating Band, is used to engage the rifling.

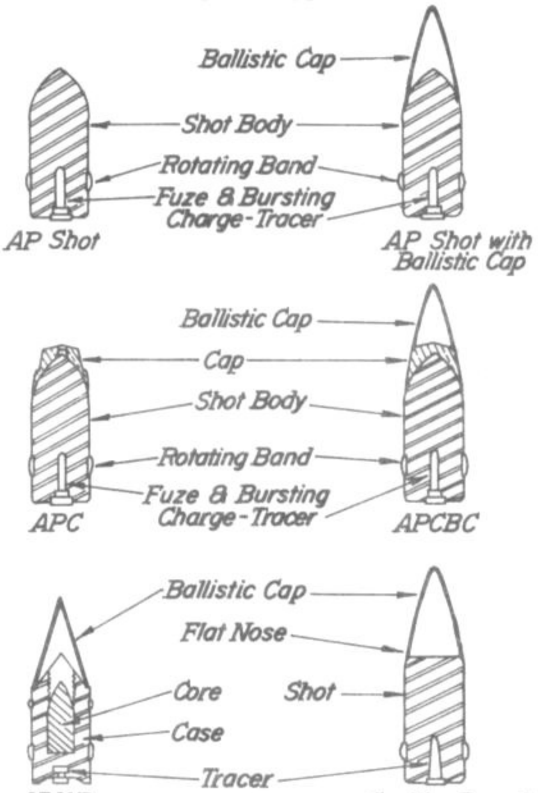
One of the most important aspects of AP Shot is the projectile point. This point lodges into the armor surface and prevents shot "tracking". On armor, tracking, or skidding, is similar to what a metal worker finds when trying to drill a metal plate that does not have a starting "nick".

The bluntness of the AP Shot head is designed to produce a rapid increase in shot to armor contact area as the shot slows down upon impact. While overall force coming to bear on the armor plate is relatively constant, the force passed by shot to armor in any instant depends upon the area of contact. If this area were to remain small, as it would in a more streamlined HE projectile, forces of compression within the shot would become so high that the shot would break up. (Theoretically, a flat-nosed shot would be ideal, but this shape had its drawbacks as will be shown later.)

Larger calibers of shot - above 50mm for example - have an added lethality. A delayed action fuze and bursting charge are inserted in place of the tracer found in smaller calibers (or combined with it - Ed.). The advantage is easily understood. Shot without a bursting charge is successful because after penetration into an AFV, it ricochets off internal surfaces to destroy equipment and men, ignite fuel and occassionally detonate ammunition. The burst produces many times more ricocheting fragments and often the detonation is strong enough to kill, touch off fuel vapors from lines it ruptures and explode ammunition. Only a few ounces of explosive are required, since the burst will be within a tightly (?) closed space. Also, the fuze must be made to withstand penetration stresses and detonate only after the projectile is well within the target body.

AP Shot performed well against homogeneous armor which were, for simplicity, equivilent to class 105,000 steel. The natural increases in armor thickness and a transition to heat treated steel found corresponding increases in shot weights (increasing bore from 37 mm to 57mm, then to 75mm on up) and muzzle velocities (from around 2000 fps to over 3000 fps). But the use of carburized steel was a different matter. This armor defeated shot by attacking its mechanical weakness: the need to keep compressive forces relatively low. Suddenly the problem became how to adapt shot for penetrating

FIGURE I. ARMOR PIERCING PROJECTILES



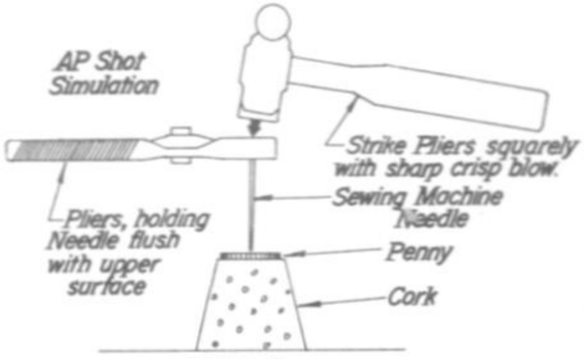

AP Shot Simulation
Strike Pliers squarely with sharp crisp blow.
Pliers, holding Needle flush with upper surface
Sewing Machine Needle
Penny
Cork

Figure 2.

the "new" armor.

The solution is giving shot a cushion against the sudden build-up of compressive force. This cushion, a soft steel cap, spreads compressive forces over a larger area; it increases the contact area between shot and armor. Such a projectile is known as Armor Piercing Capped - usually initialed APC. Like AP Shot, smaller calibers typically have smoke tracer inserted and larger calibers, a bursting charge.

To compare the action of AP Shot and APC, the reader may perform a small experiment. Materials needed are two good quality sewing needles, two or three corks, a medium sized metal-working hammer, a pliers and a penny or two. Arrange these materials as shown in Figure 2 to simulate the action of AP Shot striking face hardened armor. Be sure to make a sharp, crisp strike with the hammer. Most likely, the needle will deform by bending, without penetrating the penny armor. The deflecting point will produce a scratch...tracking. Next, insert the needle into a cork and assemble as shown in Figure 3. This is our version of APC. The cork becomes the cap on the shot, so, be certain not to let the needle point extend beyond the cork. Again, give a sharp rap with the hammer. Looking at the penny, the needle should have fully penetrated, or, at worst lodged well into the coin.

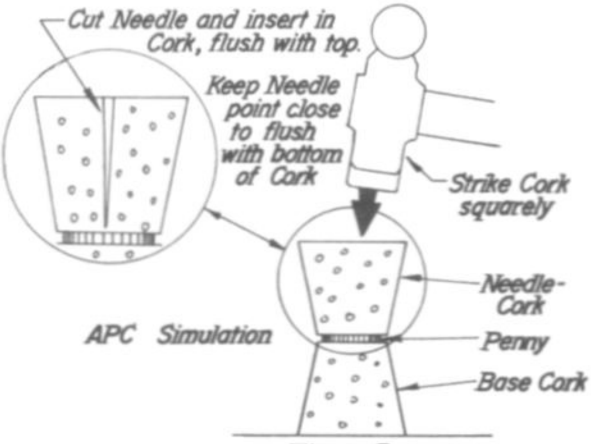

Cut Needle and insert in Cork, flush with top.
Keep Needle point close to flush with bottom of Cork
Strike Cork squarely
Needle-Cork
APC Simulation
Penny
Base Cork

Figure 3.

Capping has the advantage of keeping the shot whole upon impact and of stabilizing it to prevent tracking. But capping produces two distinct disadvantages: 1) poor ballistic properties and 2) lower impact force focused on the armor. The first disadvantage is overcome by fitting a ballistic cap as was done with some AP Shot types. With this change, the round is named Armor Piercing Capped, Ballistic Cap - APCBC. Since it is the most frequently used form of this projectile, it is often simply APC. Figure 1 shows draw- of both projectile types.

TABLE I.

Target: 110mm Low Alloy, Heat-Hardened Steel (Figure of Merit = 1.79) at 500 yards

Type	U.S. 37mm - L53.2 cal. AP	U.S. 76.2mm - L52.8 cal. APC		U.S. 76.2mm - L52.8 cal. HVAP	
Metal	C-1050 Steel	C-1050 Steel (Shot Body)	Class 65,000 Steel (Cap)	Pearlitic 50007 Steel (Case)	Tungsten Carbide (Core)
Hardness	262	262 (Shot Body)	137 (Cap)	200 (Case)	1800 (Core)
Strength	452 ft.lb. Compressive	452 ft.lb. comp. (Shot Body)	68 ft.lb. tensile (Cap)	250 ft.lb. comp. (Case)	750 ft.lb. comp. (Core)
Weight	1.92 lb.	15.4 lb.		9.4 lb. (Total)	3.8 lb. (Core)
Muzzle Velocity	2620 ft./sec.	2620 ft./sec.		3420 ft./sec.	
Impact Velocity	2570 ft./sec.	2585 ft./sec.		3365 ft./sec.	
Total Impact Energy	6.35×10^6 ft.lb. Per Sq.In.	52.6×10^6 ft.lb. Per Sq.In.		54.8×10^6 ft.lb. (Total)	22.6×10^6 ft.lb. (Core)
Contact Area	3.53 sq.in.	14.3 sq.in.		3.50 sq.in. (Core only)	
Transmitted Impact Energy	1.8×10^6 ft.lb. Per Sq.In.	3.7×10^6 ft.lb. Per Sq.In.		6.45×10^6 ft.lb. Per Sq.In.	
Measured Penetration	60mm	130mm		225mm	
Action	Shot Breaks-up, No Penetration	Indentation, No Penetration		Penetration	

Target Total Impact Strength = 5.3×10^6 ft.lb. per sq.in. (a function of impact strength and armor thickness)

The second disadvantage - lower applied impact force - is a different problem. Against lower impact strengths of carburized steels, the problem was not noticed. But against homogeneous, heat treated steels, impact strengths were much higher....enough to limit APC penetration. With this problem, no suitable solution was found. Further complicating matters was that as impact speeds began coming well over 3000 fps., even APC rounds began to fracture. And the rising use of heat treated low alloy steel was the final straw.

The search for a new type of penetrating material found one with an extremely high hardness, suitable compressive strength (which could be improved

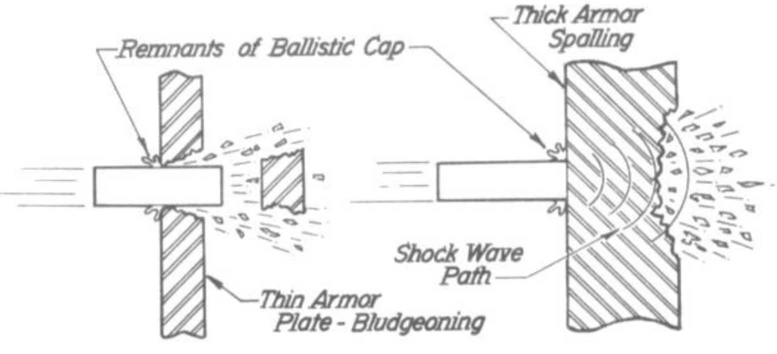


Figure 4.

by capping) and very high weight. The material was Tungsten Carbide. Its excellent armor piercing properties, however, tended to make manufacture difficult. Its high hardness causes machining problems. Its great weight rules out use as solid shot: muzzle velocities would be only 60% to 85% of a corresponding AP Shot. Tungsten carbide is also relatively expensive.

An idea came about...using a small core of the material inside a larger projectile. The lower projectile weight mounted on the same propellant charge gives a greater muzzle velocity and impact speed. (This idea also produced the discarding sabot and squeeze-bore type rounds.) Increased speed gives this projectile its name: High Velocity Armor Piercing, or HVAP. Such a projectile is diagramed in Figure 1 and its performance as compared to 37mm AP Shot and 75mm APC is shown in Table I.

Earlier it was mentioned that a flat nosed projectile would be ideal since the whole contact area forms immediately upon impact. (All compressive force immediately becomes impact force.) On the battlefield, however, this round would be useless against armor. It needs to strike exactly perpendicular to the armor plate - an occurance rarely found in combat - or it will glance off.

The action of this projectile is simple: it bludgeons its way through armor. And when armor thickness is too great, it attacks by another route. The sudden increase of impact force on the armor surface sends a pressure, or shock, wave through the armor. This wave is strong enough to break out chunks of the armor's inside surface. These fragments have a fairly high speed and act much like the burst fragments from AP Shot or APC. This action is called spalling. A diagram of a Spalling Round is shown in Figure 1; its action is illustrated in Figure 4.

The term "shock wave" brings up another method for penetrating armor; using explosives. There are two main explosive types, primary explosives and high explosives. Primary explosives may be touched off easily, while high explosives need a strong shock for ignition. Explosives of either kind have the ability to burn or detonate. There is, however, a great tendency for primary explosives to go immediately to detonation when ignited by flame, for example, while high explosives do not. Explosives which tend to burn (eg. Nitrocellulose) are propellents, or low yield explosives, and those which detonate (eg. TNT, Cyclonite) are high yield explosives. High yield, high explosives only are suitable for battlefield penetration of armor.

Such an explosive material detonates as a shock wave (called detonation wave) passes through it. In a typical high explosive round, the detonation wave originates at the fuze/ignitor placed in the center of the shell. It is given more strength by a booster, and then passes outward through the high explosive material. After the explosive is consumed, this wave keeps moving outward through air, water, steel or whatever material it contacts. This wave acts to buckle armor plate. The thickness of plate which an explosive round can buckle, or cave-in, depends upon the following: 1) type and weight of explosive used, 2) distance between armor and explosive, 3) construction of the shell and 4) armor slope with respect to path of the wave. Table II. shows thickness of Class 105,000 steel that can be buckled by typical World War II. howitzer HE rounds detonating directly upon target. It is clear that adequate armor penetration with such a weapon only begins with calibers of 150mm. Such a weapon (and the more powerful anti-tank guns developed in World War II.) are much too clumbersome for use in mobile combat. Something else needed to be designed. And, an answer was soon found.

TABLE II. Armor Penetration by Howitzers

Type of Weapon	*U.S. 75mm*	*U.S. 105 mm*	*U.S. 155 mm*	*U.S. 8 inch*	*BR. 83.9 mm*	*BR. 114 mm*	*BR. 139 mm*	*GER. 75mm*	*GER. 105 mm*	*GER. 150 mm*
Weight of Explosive in Pounds	1.47	4.8	15.9	29.6	3.4	5.0	14.5	2.0	4.8	14.5
Armor Penetration - Class 105,000 Steel	25 mm	45 mm	75 mm	107 mm	24 mm	33 mm	57 mm	16 mm	44 mm	82 mm

In exploding outward, conventional HE shells lose power from their detonation wave much like the ripple caused by a rock tossed into a pond. A way of focusing the detonation energy was discovered by

Continued on Page 28

THE MODELING OF "MARDER II"

BY F. J. "RICK" TYSON

THIS IS THE SECOND OF THREE ARTICLES DEALING THE CONVERSION OF THE TAMIYA1/35 SCALE PANZER KAMPFWAGEN II (Sd, Kfz 121) INTO A SELF PROPELLED GUN CARRIAGE - NAMELY THE 7.5 cm Pak 40/2 auf Sfl.II (Sd Kfz 131) 'MARDER II'.

THE MATERIALS YOU NEED ARE: ONE (1) KIT, ONE (1) PACKAGE OF SQUADRON SHOP SHEET STYRENE, ONE (1) H&R MG34 OR MG42, ONE (1) PACKAGE OF SQUADRON SHOP ARMOR ACCESSORIES AND BELLONA PRINT NO. 21; ALL AVAILABLE FROM ANY OF THE SQUADRON SHOPS.

THE "MARDER II" CONSISTS OF THE GERMAN 7.5 cm Pak 40/2 WITH ITS FIELD CARRIAGE MOVED AND THE ENTIRE UNMODIFIED UPPER PART WAS MOUNTED ON THE ROOF OF THE TANK HULL. THE GUN HAD LIMITED TRAVERSE OF 32 deg. LEFT AND 25 deg. RIGHT, ELEVATION +10 deg. and -8 deg. AS STATED BEFORE THE GUN; WHICH RETAINS ITS ORIGINAL SHIELD, RECOIL SYSTEM, TRAVERSING AND ELEVATING GEARS IS MOUNTED HIGH AND FIRES FORWARD. THE FORWARD PROTECTIVE SHIELD IS 10mm THICK, WHICH SLOPES, ATTACHS TO SLOPING SIDE PLATES 10 mm THICK THAT SLOPE TO THE REAR OF CHASSIS. THE GUN COMPARTMENT IS NEARLY RECTANGULAR EXCEPT FOR GUN SHIELD PROJECTION. THE OPEN COMPARTMENT IS PROTECTED IN INCLEMENT WEATHER BY A TARP. NOTE: YOU CAN BUILD THE FRONT UPPER PLATE WITH EITHER THE DUMMY VISOR LEFT ON OR DELETED. ALSO NOTE TWO STYLES OF GUN TRAVEL LOCKS.

TO BUILD THE GUN, EITHER MODIFY SUPERIORS 1/32 SCALE Pak 38 OR CONVERT TAMIYA'S 1/35 BRITISH 6 lb'er TO THE Pak 40 CONFIGURATION.

UPON OPENING THE BOX, TAKE NOTE OF PARTS: 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 20, 21, 22, 23, 24, 31, 32, 34, 40, 41, 42, 43, 44, 45, 46, 47 PLUS THE LOWER HULL, UPPER HULL, TRACKS, AND MEN. YOU WILL USE THESE PARTS IN YOUR CONVERSION.

NOW LET'S LOOK AT YOUR TEMPLATES AND CROSS-REFERENCE THEM TO YOUR PROFILE PLANS TO DETERMINE YOUR ASSEMBLY OF THE CONVERSION. I HAVE BROKEN THE CONVERSION DOWN INTO 4 MAJOR STEPS: A, B, C, AND D. ASSEMBLE STEP "B" JUST USING .40 SHEET FOR B4, .10 SHEET FOR B1, B2, AND B3 (THIS IS FOR USE WITH THE TAMIYA 6lb. GUN). ASSEMBLE STEP "C" THIS IS A PAIR OF GUN TRAVERSE SHIELDS TO BE ATTACHED TO "B". C4 IS .40 SHEET, C5 IS .40 SHEET AND THEN C1, C2, AND C3 IS .10 SHEET STYRENE. STEP "D" IS .40 SHEET STYRENE CUT OUT, SCORED AND SET ASIDE TO BE USED WITH STEP "A". STEP "A" SHOULD BE YOUR LAST STEP AFTER YOU HAVE MODIFIED THE UPPER HULL; BY CUTTING OUT LOWER GUN COMPARTMENT AND BUILT THE INNER WALLS, YOU CAN THEN ATTACH A2 AND A3 TO "D", NOW GLUE THIS GROUP TO HULL TOP. NOW ASSEMBLE AND ADJUST A1, A4, A5, AND A6 TO THIS ASSEMBLY AND HULL TOP. (NOTE: ALL GROUP "A" IS .20 SHEET SYTRENE) YOU WILL FIND THAT YOU NEED TO TRIM AND ADJUST THESE LAST PIECES TO INSURE PROPER FIT RELATIVE TO FINAL VEHICLE APPEARANCE.

(NOTE: USE TESTORS BOTTLE GLUE)

SPECIFICATIONS

CREW: 3
COMBAT WEIGHT: 10.8 tons
SPEED: 25 mph. max.
GRADIENT: 30 deg. max.
TRENCH CROSSING: 5'7"
TURNING CIRCLE: 15'9" min.
RANGE: 118 miles—ROAD
78 miles—CROSS-COUNTRY
LENGTH: 15'11"
WIDTH: 7'7"
CLEARANCE: 13½"
HEIGHT: 7'5"

FUEL: 45 gal.
SUPERSTRUCTURE ARMOR: 10mm@81 deg. —FRONT
10mm@77 deg.—SIDES
8mm @0 deg.—REAR
4mm x 2 @30 deg.—GUN SHIELD
ARMAMENT: (1) MG 34 or MG 42
(1) MP 38 or MP 40
(3) Pi 08
(1) SIGNAL PISTOL

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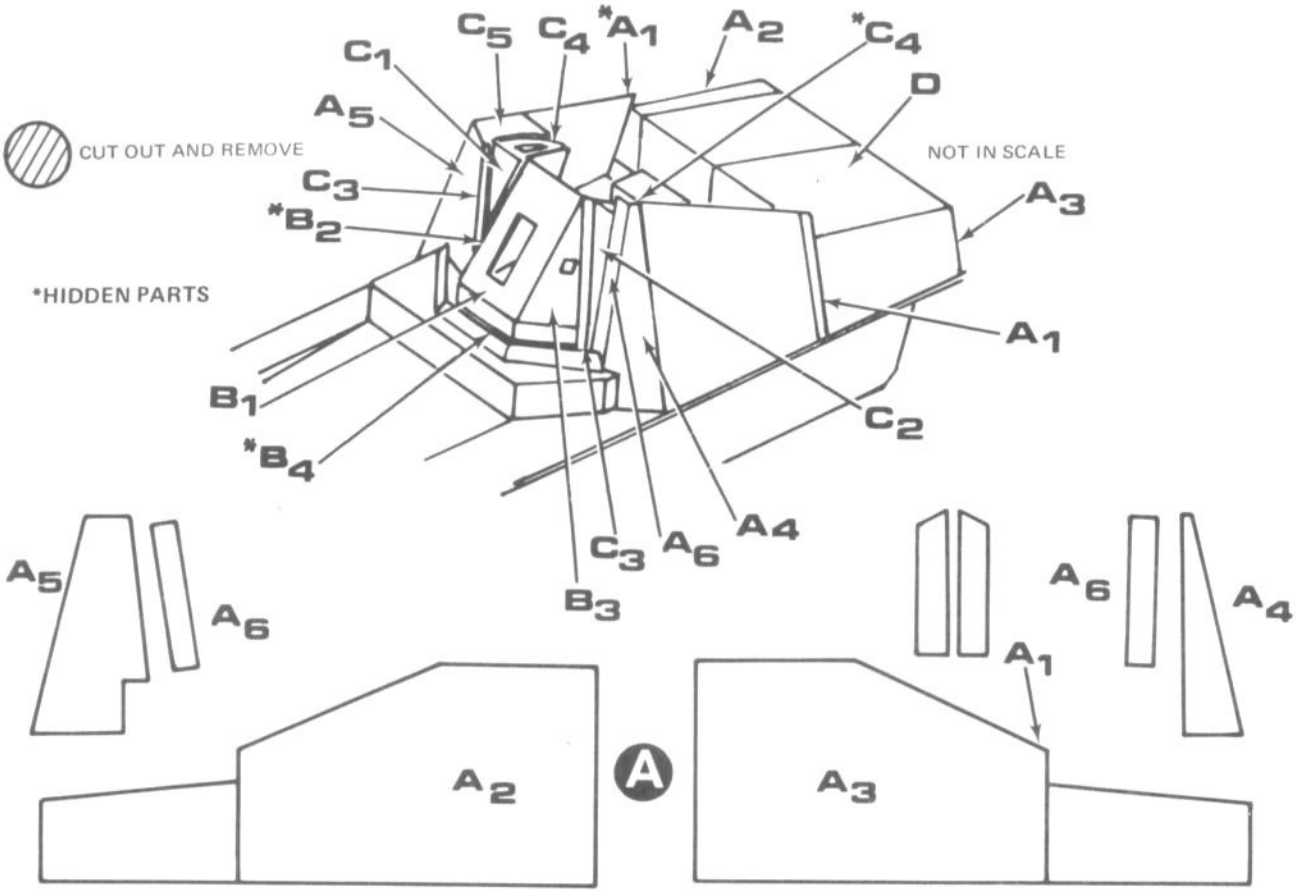
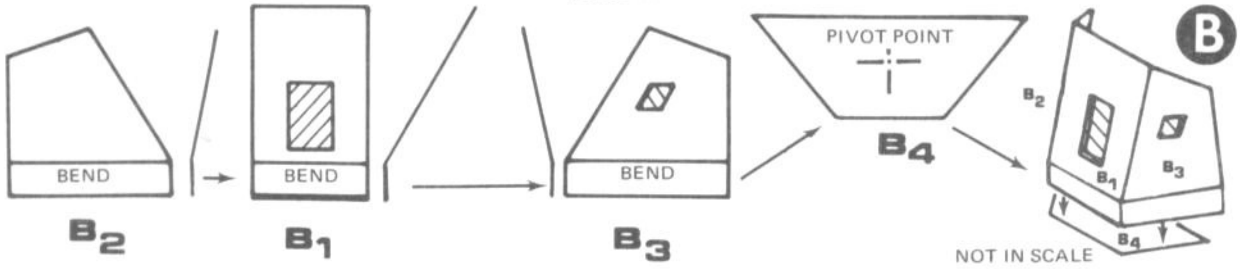
SCALE AFV SERIES



1/35 SCALE



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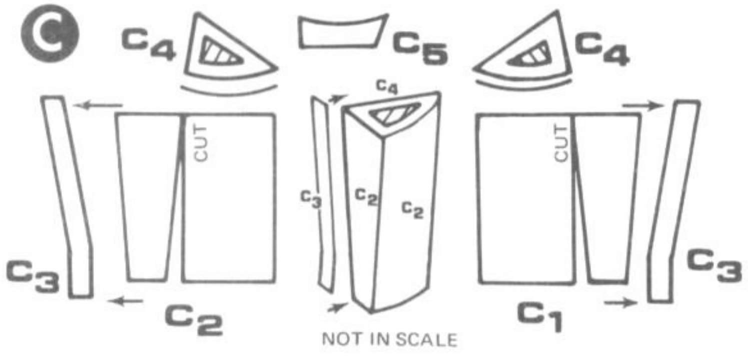
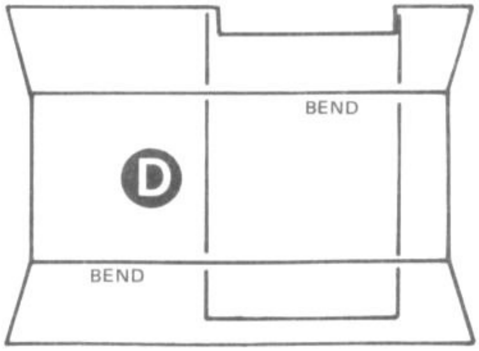




REFERENCES:

1. BELLONA MILITARY PRINT NO. 21
2. BELLONA HANDBOOK 1 WEAPONS ON GERMAN TRACKED CHASSIS
3. GERMAN TANK AND ANTI TANK by WE, INC.
4. GERMAN COMBAT WEAPONS VOL. 1 by WE, INC.

AFV INQUIRY

Armor Question from Readers, with
Answers from the AFV-G2 Staff.

QUESTION: I've been building a model of the German World War II. "Jagdtiger" tank destroyer and would like you to furnish me with authentic camouflage paint schemes for this vehicle in combat in 1943, 1944 and 1945.

ANSWER: Before talking about paint schemes for the Jagdtiger, we should spend a few minutes discussing actual production of this powerful tank destroyer. The above question is fairly common in that it requests data on such a vehicle as the Jagdtiger (or Hetzer, or Königstiger) in the 1942-43 period, when the vehicle in question was not really in production. The German production records for the 12.8cm Pak armed Jagdtiger, taken from Annex B of Volume III. of Burkhart Mueller-Hillebrand's Das Heer 1933-45, show that these were manufactured as follows:

Month & Year	Quantity
February 1944	2 (Pre-production)
July 1944	3
August 1944	3
September 1944	8
October 1944	9
November 1944	6
December 1944	20
January 1945	10
February 1945	13

Thus, it can be seen that no Jagdtigers were produced in 1943, and that up to (and including) November of 1944, only 31 vehicles had been made. At a rate of 10 Jagdtigers per company, this means that only one battalion (with a strength of 30-34 vehicles) could have been formed prior to the Ardennes fighting. Although production increased in the last three months quoted, it is evident from other sources that these vehicles were not combat ready when delivered from the factory; they lacked radios, machine guns, sighting equipment and other accessories. In some cases, they were delivered without the main armament. In most cases, Allied bombing was responsible, delaying and halting shipments of sub-assemblies to the final assembly point. These vehicles were often completed after arriving at the training and formation site for the units.

Photographic evidence shows that few Jagdtiger tank destroyers were ever employed in combat; indeed, the "combat loss table" in the above listed source shows that until February 1945, only one Jagdtiger had been lost to enemy action. Those Jagdtigers that participated in the defense of Germany in the Spring of 1945 seem to have been painted in an over-all scheme of dark "slate" gray, a color that seems to have replaced the "sand-tan" primer paint at this late stage of the war. The usual "Balkan" crosses were applied to both sides of the superstructure, and the three-digit recognition numbers, if applied at all, were in solid white on the superstructure sides.

QUESTION: In the "Organization" Article of last issue, a German document titled a "Kriegsstärknachweisung" was mentioned. Would you please provide some information about these documents? Were they similar in format to the US Army Tables of Organization and Equipment?

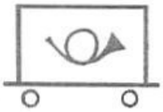
ANSWER: Yes, the German Army "Kriegsstärknachweisung" (or KStN) was very similar to US Army Tables of Organization and Equipment that are in use to this day. The two documents were similar in that they both provided the basis and structure for company-sized units. The KStN was almost identical to the first section of the TO&E, listing all of the unit's personnel and showing the category of rank. (In the German Army, there were four categories; Officers, Officials (Beamte), Non-commissioned Officers and Enlisted Men.) The KStN listed each individual's weapon, and indicated the number and type of vehicles with which the company was equipped. The company was shown divided into its sub-units, in an identical manner as charts in AFV-G2, starting with the Company Headquarters (Kompanie-Trupp), then listing the combat platoons (Züge) and finally the combat "trains" and maintenance sections (if these were present in the organization).

In the German Army system, there was additionally a second document, titled a "Kriegsausrüstungsnachweisung"; this was very similar to the second section of US Army TO&E's, listing all of the unit's equipment, again divided by sub-units (as in the KStN). Thus, to completely "structure" and study a German Army unit, it would be necessary to have both the KStN and the KAN of that unit, differing from the US Army practice where it would only be necessary to have the appropriate TO&E.

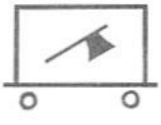
KStN's and KAN's were uniformly listed with a series of four-digit numbers, which were sometimes given a lower-case suffix letter. Armored units of the German Army were identified by the 1100 number series. The suffix letter differentiated between units that were identical in organization, but which utilized different equipment for the same purpose, and that thus might have some slight differences in personnel. For example, KStN 1149 covered the German Army anti-tank unit equipped with the Jagdpanzer IV, while KStN 1149a covered the unit that was similar but equipped with the "Jagdpanther". It should be mentioned that the Waffen-SS utilized the "standard" KStN's and KAN's of the Army for most of their units; they published their own documents for those units of a "special" nature not duplicated by the Army.

QUESTION: Could you please identify the German "tactical markings" sketched below?

ANSWER: The first sketch identifies a "Feldpostamt" or Field Postal Unit; the small curved device in the center of the rectangle represents a "postal horn" so prevalent in Europe. These units were of small size and assigned to a Division's headquarters to distribute mail.



The second sketch identifies a "Schlachterei-Kompanie" or Butcher's Company that was assigned to divisions to provide the supply of butchered meat for the division's troops. The center symbol represents a butcher's cleaver.



The rectangular outlines on both symbols indicate company-sized (or smaller in the case of the postal) units and the small circles beneath each rectangle indicates the units were motorized in trucks; both were probably from Panzer or Panzer-Grenadier Divisions.

THE SOVIET SU-76 SELF-PROPELLED GUN

by Wayne Larson

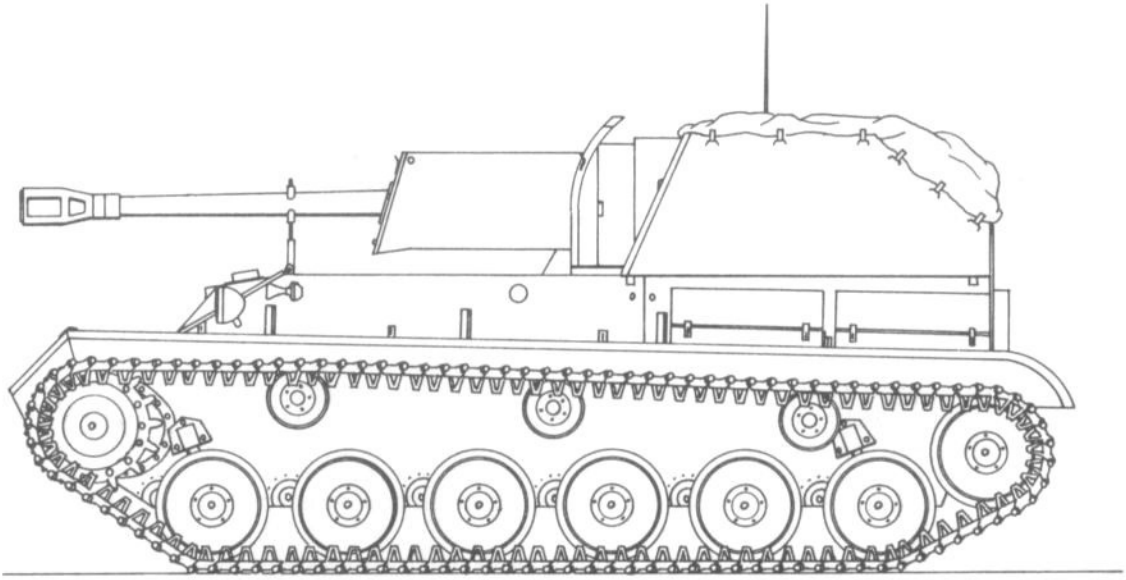
By late 1942, Soviet designers had profited from early mistakes and from experiences against the German Army, and they were preparing designs for two pieces of self-propelled artillery to support and accompany armored forces in the attack. These two vehicles, the SU-76 and the SU-122, were modifications of existing tanks and both went into production during the winter of 1942. The SU-76 self-propelled gun was based on the chassis of the obsolete T-70 light tank. Although the T-70 continued in use until 1944 as a reconnaissance vehicle, the Soviets recognized that its usefullness was severly limited by the small-caliber armament and the lack of armor protection, and so it was planned to replace the small turret and armament with a larger anti-tank weapon, increasing the load-carrying capability and power at the same time. The resulting self-propelled weapon first saw service in early 1943 in mixed self-propelled artillery regiments (which contained both SU-76 and SU-122 guns). By the summer of 1943, it had become obvious that the SU-76 was inadequately gunned and armored for combat against the new German tanks, and in this role, the vehicle was replaced by the now-developed SU-85 tank destroyer. This replacement was not, however, the end of the SU-76's usefullness, as they continued in service in Soviet Infantry Divisions until the end of the war, providing supporting artillery fire and limited anti-tank protection. American forces in Korea encountered the SU-76 in small numbers, and modern intelligence data indicates even more current useage in the armies of North Vietnam and Communist China.

The SU-76 was constructed on the chassis of the T-70 light tank, which was lengthened and modified for this role by the addition of one additional road wheel (per side) to the suspension system. The fuel tanks, driver's compartment and engine compartment were moved to the front of the vehicle so that the gun crew (of two) could stand on the hull flooring at the rear. These alterations allowed a lower-than-normal silhouette. The hull frontal armor was slightly under one-inch in thickness, while the superstructure armor plating was even thinner (.4 inch), and this inadequate armor protection, coupled with the frontal gasoline storage, made the SU-76 very vulnerable to enemy fire. Several Soviet crewmen were awarded the title of "Hero of the Soviet Union" while serving in burning SU-76's, and in general, the SU-76 was disliked by it's crews, who gave it the nickname of "flaming coffin", no doubt as a result of encounters with German Pz.Kpfw.IV.'s and Panthers.

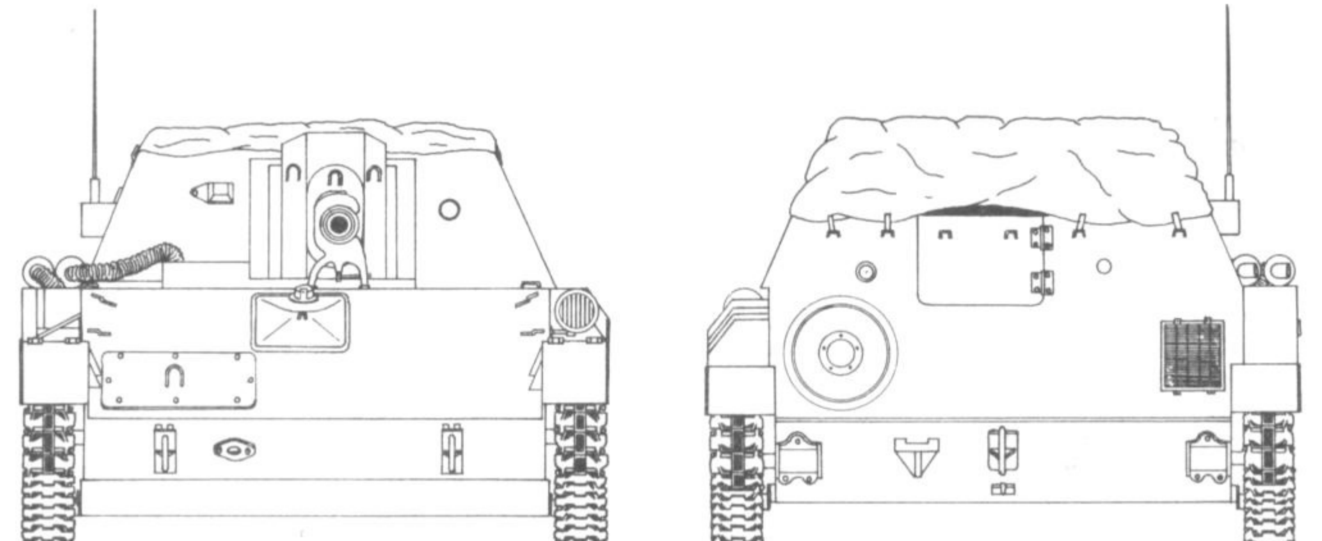
Initial models of the SU-76 were powered by a single GAZ-202 6-cylinder, gasoline engine which was air cooled. Subsequent models used twin 6-cylinder power plants to give increased power, and the SU-76M (shown in the accompanying drawings) used two of the more powerful GAZ-203 engines. These were mounted in tandem on the right side of the hull. Air was provided, both for cooling and for carburation, through screened air-intakes located above the right fender near the center of the hull. Each engine was provided with a separate exhaust hose and muffler; the two mufflers were located on top of the storage boxes on the right rear fender. The combined engines provided approximately 140 horsepower, a force sufficient to give the SU-76 a top speed of 28 m.p.h.

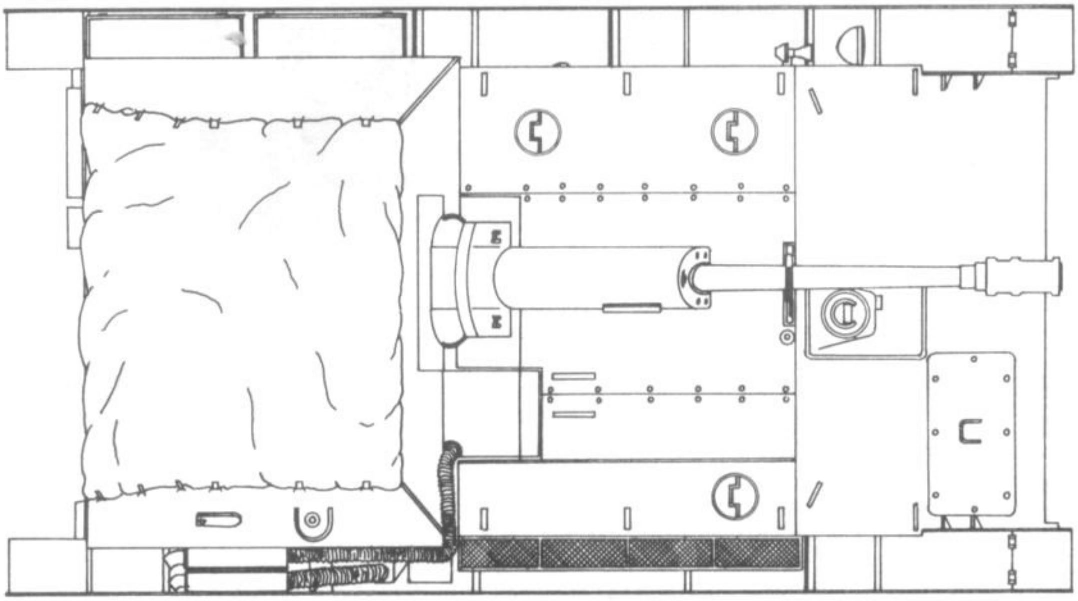
The gun mounted in the SU-76 was the standard 76.2mm divisional gun, which was modified by the addition of a double-baffle muzzle brake. This gun, the ZIS-3, was the same weapon that had been captured and used so successfully by the Germans in both the "Marder II." and "Marder III." anti-tank vehicles. Evidently, the Soviets "borrowed" the German designed muzzle brake in an effort to decrease recoil and the subsequent wear on the light tank chassis. While this gun had proven more than adequate in 1941 and as late as the summer of 1942, it was no longer effective against up-armored German tanks in 1943, and even with "arrowhead" or reduced-bore projectiles (with their higher velocities), the 76.2mm gun was largely ineffective at longer ranges. To insure penetration, the SU-76 had to get within 500 meters prior to opening fire, and at this range the lightest German tank weapon of the period (the 5cm KwK) had no difficulty in destroying the Soviet vehicle. Although the 76.2mm gun was still a good weapon, by 1943 it had outlived its usefullness as an anti-tank gun.

With the replacement of the SU-76 by the SU-85, the lighter vehicle was relegated to support of Soviet infantry units. In this role, it was more than adequate, firing a 14.5-pound HE projectile to a maximum range of 12,500 yards. It was the only self-propelled gun in the Infantry Division and it offered much needed support in the attack, and in the defense as an anti-tank gun (if it was needed). Although changed from its early designed role, the SU-76 proved itself in service use as a self-propelled artillery piece firing in the indirect fire role.

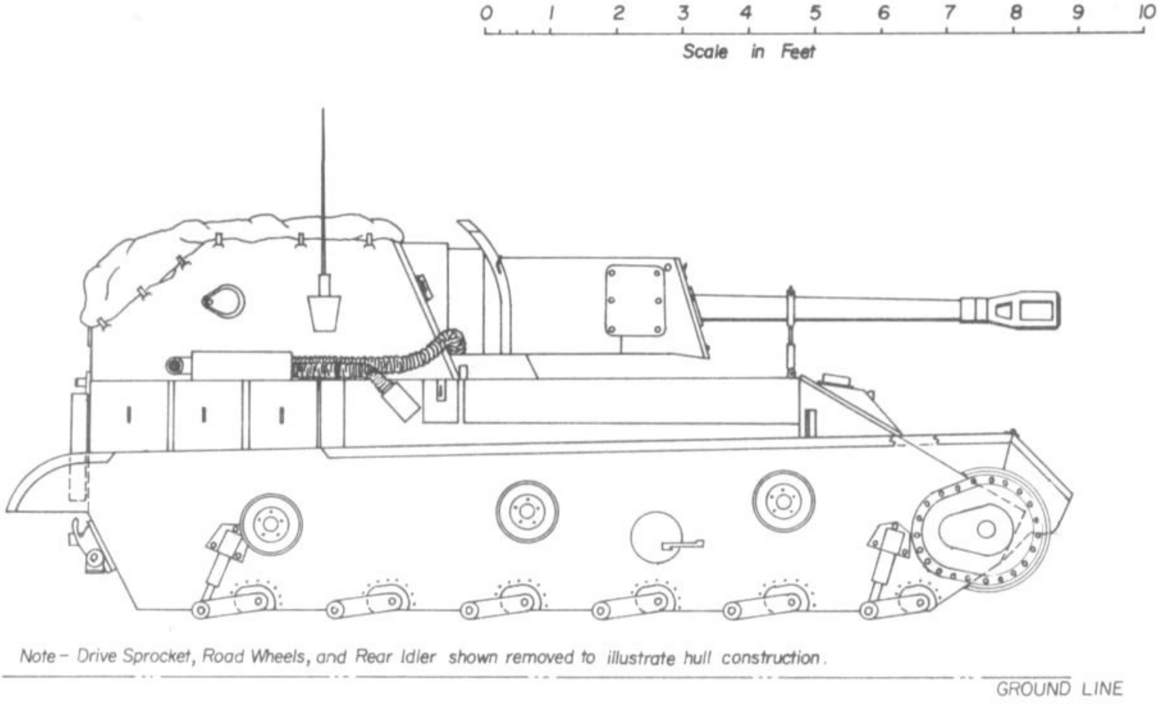


SOVIET SU-76M SELF-PROPELLED GUN





Drawn by J. Steuard



Note – Drive Sprocket, Road Wheels, and Rear Idler shown removed to illustrate hull construction.

THE BARON'S BOOKSHELF

With books for your bookshelf

Book Review: The 79th Armoured Division, Hobo's Funnies, by Nigel Duncan (Profile Publications Ltd., Berkshire, England, 70pp.)

Review by William Platz

Taken mainly from the chapter in "British and Commonwealth AFV's, 1940-1946", Profile Book Number 3 is not so much a divisional history as it is an in-depth coverage of the various specialized Armoured Fighting Vehicles used by the British during World War II. The strength of the book is the large number of DETAILED photographs of the "Funnies", many of which are in the 1/3 to 1/2 page format which further increases their value. Indeed, photographs take up most of the space in the book, and as a result the text portion suffers. There is good general coverage of the types of Armoured Vehicles used by the division, and of the major operations involving its sub-units; however, the detail that one could expect from a unit history is missing. Nevertheless, the training and development of the formations are covered well, and, all-in-all, the book is a worthwhile addition to your technical library on armor, covering an unusual armoured unit in good style.

Book Review: Portrait of Power; a Photo-History of United States Tank and Self-Propelled Artillery, by Colonels G. B. Jarrett and R. J. Icks (Normount Technical Publications, Forest Grove, Oregon 97116, 146pp, $5.95)

Review by Duane Thomas

As the title indicates, this is a photographic history of U.S. armored vehicles, both tanks and self-propelled weapons. The text is at a minimum (being almost entirely photo captions) and there are over 250 photographs, covering armor from its inception in the US Army until approximately 1968. I was especially glad to see the numerous photographs of such rare vehicles as the T28 Multiple Gun Motor Carriage, the T30 Gun Motor Carriage, the M-5 3" Gun Motor Carriage the T52 Multiple Gun Motor Carriage and others. Many of the photos are action shots taken in the ETO showing field modifications and accessories; many have never been published before. This is a most worthwhile effort, and is of special interest for students of U.S. armor.

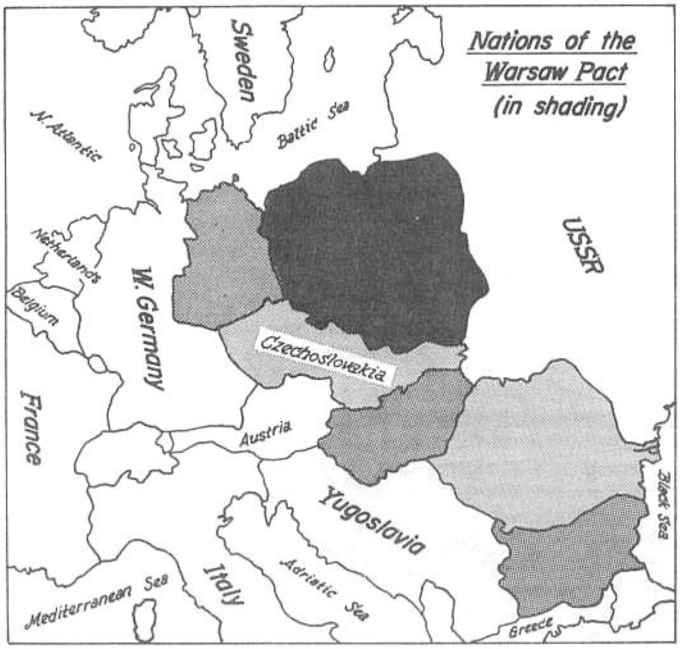
The only real criticism that I have has to do with the variation in photographic quality and the "newspaper"-like paper. But, at a price of $5.95, it is a bargin when you consider such a large collection of rare photographs. There are a few incorrect captions (such as a M19A1 40mm Gun Carriage in Korea labeled as a M42), but all-in-all, this book is a virtual bible on U.S. Army armored vehicles, and it can well be recommended to our readers.

The Baron's Bibliography - A Continuing Feature Covering the North African Desert Campaign....

5. Schmidt, Heinz W., With Rommel in the Desert (Ballentine Books Inc., New York, NY, 1967, 256pp, 12 ill.) PB-IP (George G. Harrap & Co. Ltd., England, 1951) HB-OP(?)

Written by a former Hauptmann (Captain) of the DAK who served with Feldmarschall Rommel as his Aide during the 1941 period, following which he commanded a company of the 115th Rifle Regiment (of the 15. Panzer-Division). The author must have been one of the most senior DAK officers as he entered Africa in January 1941 and was in combat until the end fighting in Tunisia, when he was sent home on leave to get married! His narative gives quite a picture of Rommel's personal life in the desert and what it was like to be a junior officer directly under Rommel's command. This book represents one of the very few personal naratives from a member of Rommel's Staff, who saw much combat experience. It is well written and can be recommended as an excellent book from an unusual viewpoint.

- Continued on Page 29 -



ARMOR G-2

Current Data on the World's Armored Forces .

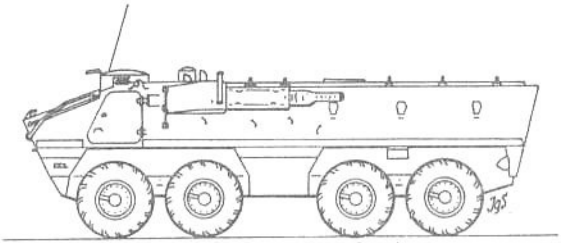
Armor of the Warsaw Pact

by J. C. Johns

CZECHOSLOVAKIA

Strength of Armed Forces: 145,000
Term of Service: Twenty-Four Months

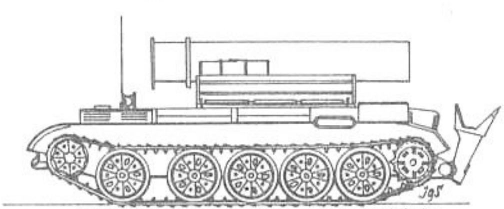
Armored Equipment: 100 JS-III. and T-10 Heavy Tanks; about 3400 Medium Tanks, mostly T-55 and T-62 types, with some T-54 and T-34/85's remaining. Reconnaissance vehicles include OT-65 and FUG-1966 scout cars. In addition, OT-62 and OT-64 Armored Personnel Carriers are used to a great degree.


OT-64 Armored Personnel Carrier

Artillery: SU-100, JSU-122 and JSU-152 Self-propelled Guns; 82mm and 120mm Mortars; Frog and Scud Surface-to-Surface Missiles; 57mm, 85mm and 100mm Anti-tank Guns; "Snapper", "Swatter" and "Sagger" (NATO designations) Anti-tank Guided Weapons; 30mm and 47mm Twin Self-propelled Antiaircraft Guns and some SA-2 Surface-to-Air Missiles.

The above equipment is used to form four Tank Divisions, eight Motorized Rifle Divisions and one Airborne Brigade. These are at about 70% of assigned strength except for two Cadre Motorized Rifle Divisions which are at 30% of authorized strength.

Paramilitary forces and Border Troops number some 35,000 and there is a part-time People's Militia of approximately 120,000 members.

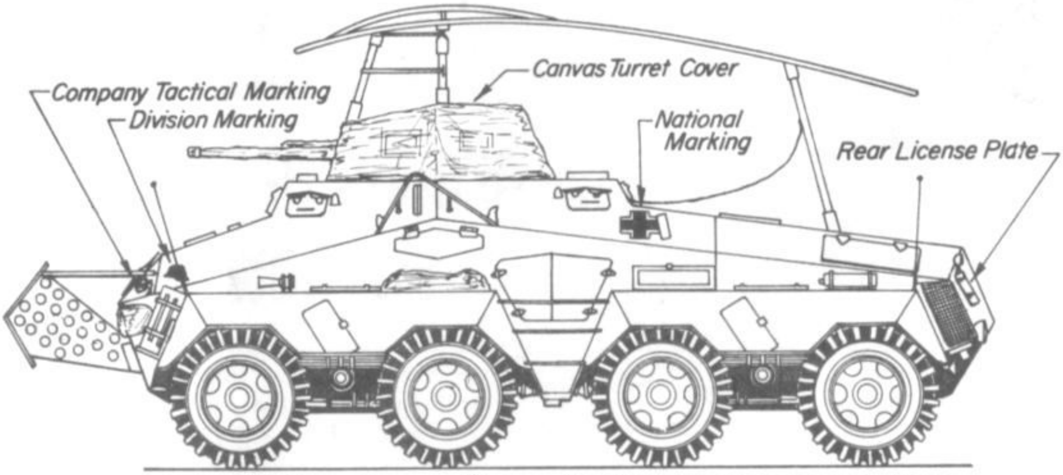

T-54/T Armored Recovery Vehicle

Czechoslovakia is the only one of the Communist nations of the Warsaw Pact (except the Soviet Union of course) to design and manufacture its own weapons and armored vehicles. These include pistols, sub-machine guns, machine guns and recoilless rifles, in addition to the "OT" series of armored vehicles which are either design modifications of Soviet equipment of wholly-Czechoslovak designed and manufactured. This self-reliance on it's own production stems from the Skoda pre-World War II. factories and the German increase in Czechoslovak potential during the war, which was not damaged to any great degree by Allied bombing.

COLOR 'N CAMOUFLAGE

The German Sd. Kfz. 232 Eight-Wheeled Armored Car in Russia - 1942

by Steven Cobb and James Steuard

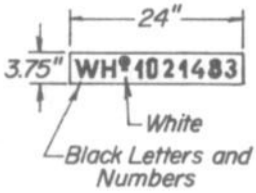


Side View - Panzerspähwagen (Funk), Sd.Kfz.232 of 3.Schwadron, Kradschützen-Abteilung „Grossdeutschland"

On April 1st, 1942, Adolf Hitler personally ordered the formation of a new German division to be known as Infanterie-Division (motoriz.) "Grossdeutschland". While titled an Infantry-Division, the new division had a Panzer-Abteilung of 30 tanks and a Sturmgeschütz-Abteilung of 21 guns of the newest type. Thus, the division had as much armor as a contemporary Panzer-Division. In addition to other new units of the division, a new Kradschützen (or "Motorcycle") Abteilung was formed for reconnaissance purposes. The term "Kradschützen" did not indicate the equipment of the new battalion as it was actually equipped with light Volkswagen cars, light armored halftracks (Sd. Kfz. 250/1), and both light and heavy armored cars. The subject for this article was one of the new Sd. Kfz. 232 Eight-Wheeled, Communications Armored Cars of the 3. Schwadron (which was regularily equipped with Volkswagen Kübelwagens) of Kradschützen-Abteilung "Grossdeutschland".

In common with most armored equipment at this time, the Sd. Kfz. 232 was painted in an overall scheme of dark blue-gray, as shown below in the paint sample. The vehicle appeared in new condition, as it had just been received by the battalion. When not in use, the turret was covered with a field-gray canvas cover, to protect the guns and interior from the weather, as shown in the side-view drawing above.

The Sd. Kfz. 232 armored car was identified by front and rear license plates, as shown in the sketches to the right. The front license plate was painted on the lower surface of the front shield/storage compartment in a single-line style, with the characters "WH-1021483" in black on a white background. The typical official German "Feldpost" rubber stamp had been applied in the vicinity of the "dash" for identification purposes. In the rear, an aluminum license plate was fastened on either side of the hull, on the fender brackets provided for this purpose. The rear plates were also lettered in black on a white background, with the letters "WH" appearing above the numbers. Again, the rubber stamp was applied near the right of the letters "WH" to identify the "owner" of the vehicle.



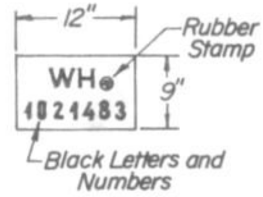
Front License (Painted)

PANZER BLUE-GRAY

5 pts Floquil RR12 Reefer Gray
2 pts Floquil RR10 Engine Black
2 pts Floquil RR56 Big Sky Blue

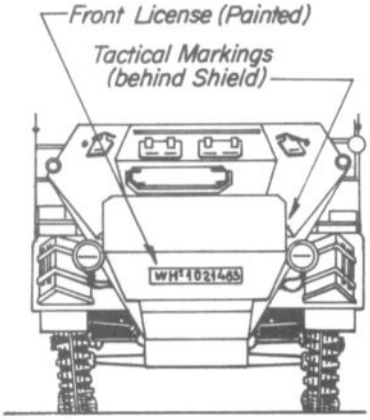
■

The typical German national identity "Balkan" crosses were painted on both sides of the vehicle on the upper slopes of the hull armor as shown in the side-view. Additionally, the same cross was painted in a centered location on the rear of the Sd. Kfz. 232 as shown in the partial rear-view on the opposite page. No cross



Rear License Plates

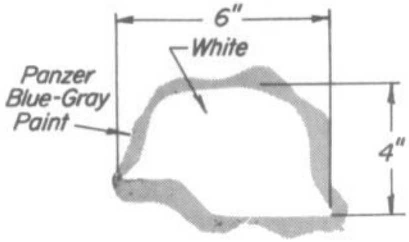
was painted so as to appear to the front.



Front View (minus Turret and Antenna)- Sd.Kfz.232 Armored Car

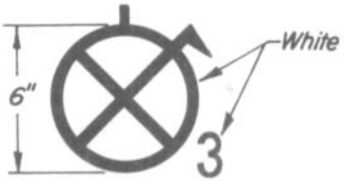
In forming Infanterie-Division (mot.)"Grossdeutschland" from the former Infanterie-Regiment of the same name, the tactical marking for the regiment was retained. This symbol consisted of a side-view of the German steel helmet in white, facing to the left. This marking was applied to both front and rear of the Sd. Kfz. 232. In the front, the marking was painted on the right side of the hull behind the shield, as shown in the side-view on the preceding page. In the rear, the tactical marking for "GD" was painted on the left side of the rear plate near the top, as shown in the partial rear-view below.

Beneath the divisional tactical marking appeared the standard German Army tactical symbol for a "motorcycle" or Kradschützen company. This consisted of an outline form circle quartered diagonally with lines. At the top of the symbol, a short bar denoted a "company" (or in the case of "GD", a Squadron, as this division carried on the Hussar's tradition). The right diagonal line extended beyond the circle and ended in a pennent. This symbol also included the number "3" at the lower right to indicate the numerical designation of the Squadron. This entire marking appeared in white.



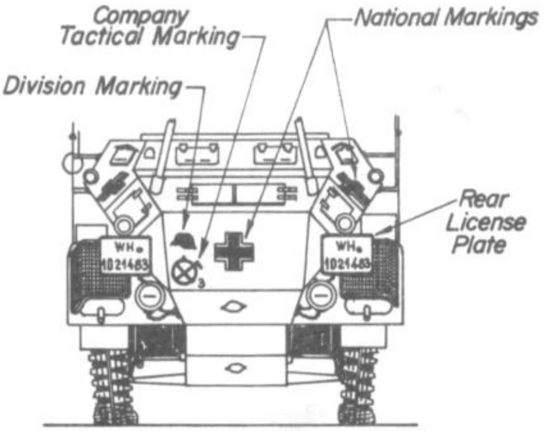
Tactical Marking - Infanterie-Division (mot.) „Grossdeutschland"

Kradschützen-Abteilung "Grossdeutschland" consisted of a Headquarters Company (Stabs-Kompanie) and five numbered reconnaissance "squadrons". The 1. Schwadron was equipped with both four and eight-wheeled Panzerspähwagonen (or armored cars), the 2. Schwadron was equipped with Sd. Kfz. 250/1 armored halftracks, and the 3. Schwadron, as previously indicated, was provided with Volkswagen Kübelwagens for light reconnaissance duties. The 4. Schwadron was formed as a machine-gun company, equipped with both Volkswagens and Kfz. 1 vehicles, while the 5. Schwadron was a "schwere" or Heavy Weapons Company, with an anti-tank platoon, an engineer platoon and an infantry-gun platoon. The battalion commander was Major Horst von Usedom, who had won the Knight's Cross the preceding winter while in command of Kradschützen-Abteilung 1., and he instilled a feeling of "elan" in his new command that was to prove of great value in the coming fighting.



Tactical Marking - 3. Squadron, Kradschutzen - Abt. "GD"

By May of 1942, the new division was fully formed and in the process of training at a maneuver ground near Frankfurt/Oder (TÜP Wändern/Neumarkt). The division, with 18,000 men, was one of the largest in the German Army. On 14 May 1942, the division received its march orders and began to prepare for movement to the east. On 23 May, the mass of the division moved by rail to Mielau, Poland, and moved under its own transportation from there to Fatesch (NE of Kursk) for a period of maintenance and final training.



Rear View (minus Turret and Antenna)- Sd. Kfz. 232 Armored Car

On 27 June, the attack order was issued for the attack towards Stalingrad and the Volga River. Infanterie-Division "GD" was to attack alongside the new 24. Panzer-Division in an attempt to effect a breakout through the strongly defended Soviet lines. Kradschützen-Abt. "GD" was given the assignment of area reconnaissance following the breakthrough, following the initial period of flank security. Soon, the armored cars of the battalion were racing ahead of the attacking Panzers, searching for areas of resistance and the best routes forward. The eight-wheeled armored car of our article was soon involved in the forefront of the fighting, passing important messages back to battalion and division headquarters to enable the Panzer units to find the best place to attack the Soviets in the drive on Stalingrad.

ARMOR in VIETNAM

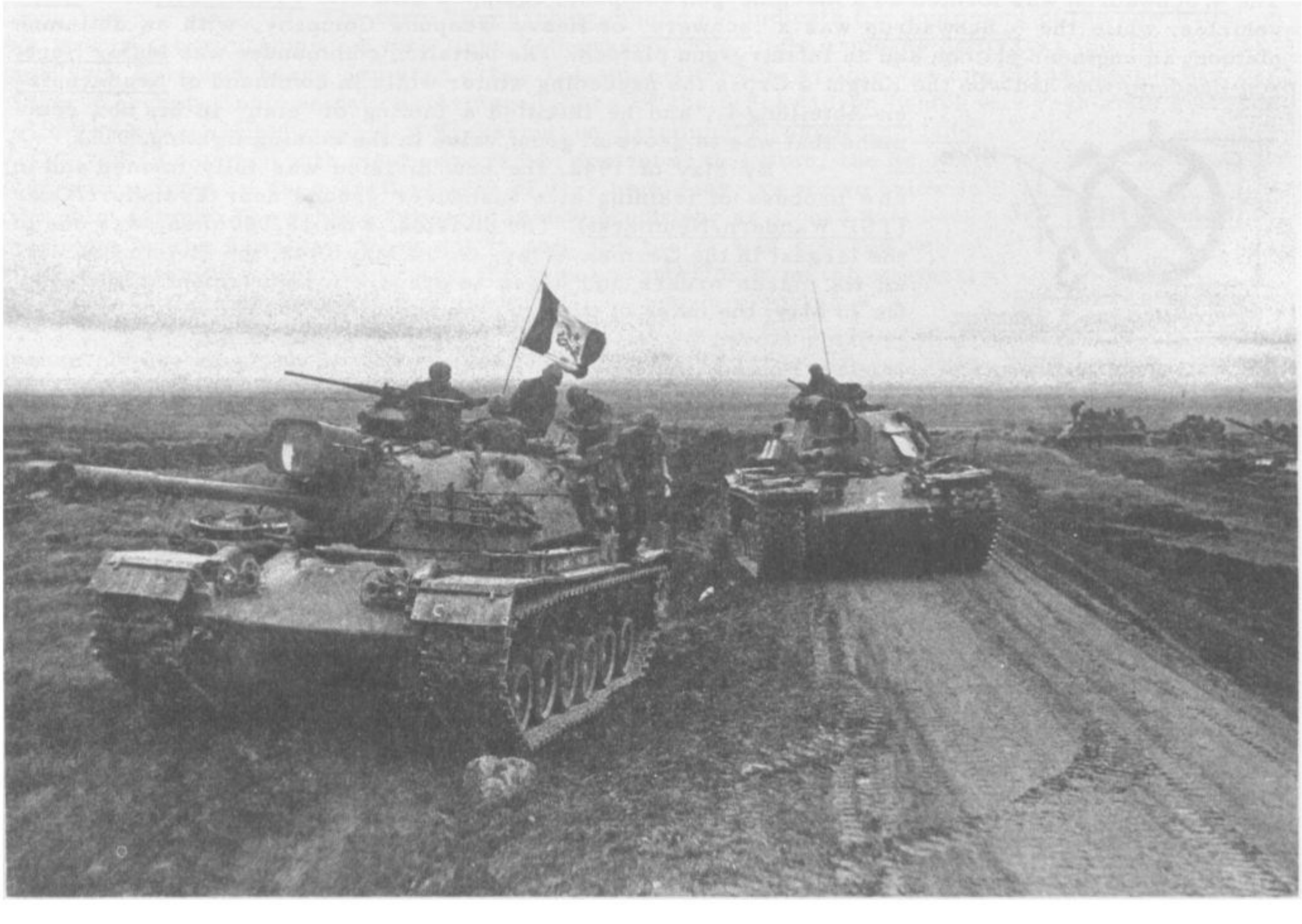
The M-48A3 Medium Tank

The principal tank used in the Republic of Vietnam by U.S. Army and U.S. Marine Corps armored units is the M-48A3 Medium Tank. The vehicles illustrated in these three photographs are from "C" Troop of the 3rd Reconnaissance Squadron of the 5th Cavalry, assigned to the 9th Infantry Division. While the majority of the 9th Infantry Division operated during 1967-69 in the Mekong Delta area of South Vietnam, the divisional armor operated as a separate "task force" in the northern part of South Vietnam, near the De-Militarized Zone (or DMZ), and it was there that these photographs were taken.

Photo Below: The land in the background is North Vietnam, as seen across the DMZ! Two M-48A3's from "C" Troop pause for "refreshment" (note the beer can) during a halt in operations. The Troop's Armored Personnel Carriers (M-113's) can be seen in the right background. In common with many armored units in Vietnam, some Tank Commanders of the 3/5th Cavalry "fly" their State flags from the antennas; it is evident that the Tank Commander in the lead M-48A3 prefers the Mexican flag. As can be seen, the commander's cupola-mounted machine gun has been removed, and the gun port has been blanked-off; a standard free-swiveling .50 caliber machine gun has then been mounted on top of the cupola.

Photo Above Right: An M-48A3 and two M-113's of a Troop of the 3/5th Cavalry near the DMZ. The unit has just occupied this position on top of a small hill. Note the quantity of "living necessities" carried on top and fastened to the armored vehicles. The commander of the M-48 is firing his cupola-mounted .50 caliber machine gun in an attempt at "reconnaissance by fire".

Photo Below Right: Another Troop "C" M-48A3 moving through lush vegatation on a "sweep" near the DMZ. Almost all M-48A3's of this unit carry "C" Ration boxes fastened to the turret side handrails. Note the commander's M-16 rifle carried slung forward of the range finder hood; this is convienent if the commander has to dismount to guide his vehicle past obstacles. All of the vehicles also mount the xenon searchlight above the gun tube for night illumination, in case of ambush or attack.



U.S. ARMY 09467068

The "Jagdpanther" Heavy Tank Destroyer Company

by James Steuard

By 1944, the German need for a heavier-gunned Tank Destroyer had become evident, with the appearance of the Soviet heavy JS-II. tanks. As a partial fulfillment of this need, the "Jagdpanther" (or Hunting Panther) was developed from the very successful Pz. Kpfw.V. "Panther" tank. This vehicle married the refined "Panther" chassis with the already proven 8.8cm Pak "super-long" gun (of L/71 length). The first vehicles were delivered to the Army in the beginning months of 1944, and sufficient were on-hand by April of 1944 to form the first battalion of these vehicles. By the end of the war in May 1945, a total of 341 of these excellent tank destroyers had been delivered; this was enough vehicles to equip approximately five Tank Destroyer Battalions, counting on combat losses and replacement vehicles. (The highest number of "Jagdpanthers" available to the German Army at any given time was 208; this number was available in March of 1945.)

With it's super-long, powerful gun, the "Jagdpanther" was formed into "Heeres" Panzerjäger-Abteilungen (or Army-level Anti-Tank Battalions), following the policy of centralizing the powerful and effective weapons under Corps or Army control. Although these battalions were designed for major employment on the Eastern Front, at least two "Jagdpanther" battalions saw service on the Western Front, against the Americans. Individually, the "Jagdpanther" was able to effectively deal with any Allied armored vehicle (with ease), but there were never enough combat units equipped with these tank destroyers to effect the outcome of the conflict. It is interesting to contemplate the outcome of the war, had the Germans been able to produce as many "Jagdpanthers" as Sturmgeschütz III. assault guns............

Following the more-or-less standard battalion organization of the time, each Schwere-Panzerjäger-Abteilung "Jagdpanther" was formed with a Headquarters and Headquarters Company (or Stab und Stabskompanie), three Anti-Tank Companies (schwere-Panzerjäger-Kompanien) and a Supply and Replacement Company (Versorgungs-Kompanie), in line with the "frei Gliederung" concept. which centralized all replacement, supply and maintenance functions under a battalion-level unit.

The individual schwere-Panzerjäger-Kompanien were organized under Kriegsstärknachweisung 1149a, dated 1 March 1944, with an effective strength of 3 officers, 42 non-commissioned officers and 42 enlisted men. As individual weapons, the company had 12 rifles (mostly in the Headquarters Section), 73 pistols, 30 machine pistols (or sub-machine guns), and the 28 light machine guns and 14 cannons of the armored vehicles. (There was one MG34 and one MG42 per Jagdpanther.)

The Headquarters Section (or Kompanie-Trupp) consisted of 1 officer (the Company Commander), 8 NCO's and 9 enlisted men. The Section had two "Jagdpanther" tank destroyers, organized into a small combat section led by the unit commander, and two light cars (typically the Volkswagen Kübelwagen) and a motorcycle or Kettenkrad (tracked motorcycle) for communications purposes. The company commander normally rode in one of the light cars and transferred to his tank destroyer for combat; in the car, he was accompanied by a NCO radioman (who also was the headquarters section leader). Both light cars contained a "pack" radio set, which could be removed and used away from the vehicles if desired. The motorcycle (if not on the Eastern Front) was a sidecar machine (either the BMW or the Zündapp) carrying a driver and a messenger. The KStN has a footnote indicating that the tracked Kettenkrad was to be used only in Russia (due to shortages), in which case it could carry the same two-man crew (driver and messenger).

The Panzerjäger-Kompanie had three combat platoons, each with 1 officer (except the 3. Zug, which was led by a senior NCO), 11 non-commissioned officers (12 in the 3. Zug) and 11 enlisted men. Each Platoon had one light car, a motorcycle (or Kettenkrad) and four "Jagdpanther" tank destroyers. The Platoon Leader utilized the car when not in combat and then transferred to his Sd. Kfz. 173 "Jagdpanther" as required. One of the other tank destroyer commanders (usually the senior NCO) acted as the Assistant Platoon Leader (there was no "Platoon Sergeant" in the US Army sense) when required by the absense of the normal commander. The small Platoon Headquarters had one NCO (in the light car) as an Observer; he performed reconnaissance as directed by the Platoon Leader, to obtain targets and positions for the tank destroyers.

The Company was lacking in Mess or Recovery personnel; these functions had been absorbed by the Versorgungs-Kompanie. In actuality, although the Supply Company had the responsibility of feeding and maintaining the vehicles, the company was semi-self sufficient; each tank destroyer carried it's own small cooking stove, and vehicle crews were trained to perform recovery operations, towing disabled vehicles with their "Jagdpanthers".

Although small in actual numbers, the "Jagdpanther" tank destroyer companies were well equipped to make their presence felt on the battlefield. We shall probably never know how effective they actually were, as most combat records were destroyed as the war came to an end.

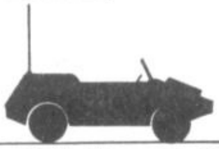
SCHWERE-PANZERJÄGER-KOMPANIE „JAGDPANTHER"

KStN 1149a (f.G.) of 1 March 1944

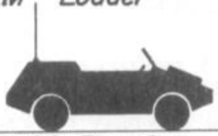
HEADQUARTERS-SECTION

1 NCO Gunner
1 NCO Radioman
1 NCO Driver
1 EM Loader

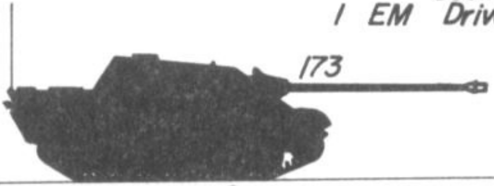
1 EM Driver
1 EM Messenger



1 OFF Company Cmdr.
1 NCO Radioman-Section Leader
1 EM Driver



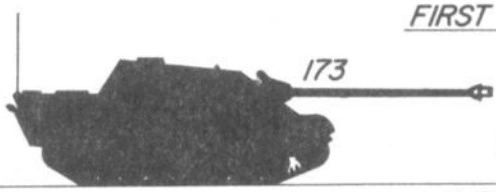
1 NCO First Sgt.
1 NCO Equipment Sgt.
1 EM Radioman
1 EM Driver



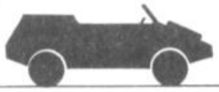
1 NCO Vehicle Commander
1 EM Gunner
1 EM Radioman
1 NCO Driver
1 EM Loader

FIRST PLATOON

1 NCO Vehicle Commander
1 NCO Gunner
1 EM Radioman
1 NCO Driver
1 EM Loader



1 NCO Gunner
1 EM Radioman
1 NCO Driver
1 EM Loader



1 OFF Platoon Leader
1 NCO Observer
1 EM Driver

1 NCO Vehicle Commander
1 EM Gunner
1 EM Radioman
1 NCO Driver
1 EM Loader

1 NCO Vehicle Commander
1 NCO Gunner
1 EM Radioman
1 NCO Driver
1 EM Loader

1 EM Driver-Messenger

SECOND PLATOON & THIRD PLATOON — Identical to First Platoon, except that Platoon Leader of the Third Platoon is an NCO.

Wargame Review

How to Steal a Set of Rules

by William Platz

All too often an enjoyable evening over the wargame board has been ruined by needless arguements over the rules. I say needless, because most of them could have been prevented if the regulations of play had been clearly and completely set down. Unfortunately, too many wargamers are more concerned with the game than with the rules by which it is played, and the result is often chaos on the gaming board.

Writing your own rules (and doing a proper job of it) requires a great deal of dedication and spare time, as well as a flair for mathematics and a vivid imagination; and, since most of us are lacking at least one of these essential ingrediants, I would strongly recommend one of the several published sets of rules. Of course, no one system will fit every situation, but it is remarkable how a few table conversions and a "house rule" or two can change a standard set of rules into a system custom tailored to your own needs.

As an example, let's say you are equipped with 1:285th scale "Micro-Armour" miniatures and you are interested in gaming with maximum realism rather than ease of play. Under these conditions, an ideal set of rules would be "Tractics", published by Guidon Games; however these rules were written for use with HO scale vehicles in a small area of play. Nevertheless, the conversion is a relatively simple matter.

The first item that you will have to change will be movement rates. In "Tractics" all movement is based on the maximum speed of the vehicle converted into inches. This is given in a chart showing maximum movement under various conditions of terrain. The entire table is easily converted for "Micro" scale use by equating one-inch with one-centimeter. An ordinary metric ruler, therefore, can be used to measure all movement.

The problem of concealment and detection is a little more complicated. Here it must be remembered that the original rules were designed for an area of only 10 to 12 feet in length (in HO scale, approximately 400 yards). In "Micro" scale, this same distance would be equal to about 1200 yards. Actual visibility for vehicles in the open would be a maximum of about 4000 yards; however, this distance should be scaled down so that maximum visibility would be equal to the length of the playing area, then the other limits of observation can be set proportionally.

The "Tractics" firing proceedure also requires a bit of modification for use with Micro-Armour. Many of the early "Micro-Armour" pieces do not have moveable turrets and therefore, turning turrets becomes a bit impractical. However, the same effect can be obtained by using a pin or match stick to indicate direction of fire. Ranges should be altered on the same basis as observation; that is, set a maximum range at 2000 yards, or half of maximum observation and apply this to your playing area. Then adjust the rest of the ranges proportionally.

And there you have it...... Add a few house rules to fit special problems, such as defining the effect of that 4" by 4" post that emerges from the middle of your board, or a provision for mechanical breakdowns for vehicles whose operators argue with the umpire, and jot these down in the back of your rule book.

One further note. Make sure that all of the players have a chance to study the rules before the game, particularily the referee; and that a copy of the rules with all special regulations is close at hand during the action. This won't stop all arguements, but it helps to settle them before someone throws one of your "Tiger" tanks through the wall.

Editor's Note: "Tractics" is a Three-Volume Set of Wargame Rules published by Guidon Games, Post Office Box 1123, Evansville, Indiana 47713. The set retails for $7.50 complete, and the individual volumes that make up the set may be purchased separately. Volume I. covers "Tank and Antitank" rules and sells for $5.00, with Volume II. (on Infantry and Artillery rules) and Volume III. (on Modern and Special rules) each selling for $2.00.

"Battered Hulks and Cockleshells"; British Armour on Crete (Continued from Page 7)

May 22nd that a serious counterattack was launched. Once again only a small portion of the available forces were to be employed - two battalions of infantry and again only three of the seven available tanks. From positions at Platanais the 20th and 28th New Zealand Battalions began to advance at 0330 after a two-hour delay. Between the infantry battalions, Lt. Farran's three Mark VI. Lights moved out in single file along the main road. The tanks opened fire with machine guns as small groups of paratroopers were rooted out along the way. The advance was steady but slow and it was not until dawn that the troop reached the road junction just outside Pirgos. Here the tarmac road was bordered on both sides by bamboo thickets. It was an ideal spot for an ambush and Farran hesitated. Captain Dawson from 5th New Zealand Brigade H.Q. came up and urged the leading tank forward. The tank edged from cover around a bend and was immediately hit twice at close range by 2 captured Bofors guns sited behind a stone-walled cemetary. The first shot killed the tank commander, Farran's Troop Sergeant, and the second wounded the driver and gunner, Trooper Charles Wilds. Fatally wounded, Wilds opened fire with his Vickers, knocking out one of the guns while the driver brought the tank back into cover. At about the same time, a swarm of Me.109's arrived on the scene and caught the remaining two tanks in the open. A storm of machine gun bullets lashed at Farran's tank, smashing into the turret and filling the compartment with stinging bits of hot metal. Frantically he drove into the bamboo thicket, crashing into the cover and tearing loose a bogie wheel. The second tank found shelter under a large tree but Farran ordered it back since it was senseless to try to go on in daylight. There was some hope of repairing the damaged bogie with parts from the other damaged Mark VI. but it would take some three hours for the fitters to get forward from Squadron HQ. Then the planes were back and diving again. The two tanks were abandoned and Farran made his way back on foot, dashing from cover to cover and crawling along drainage ditches. In his journey, he was pursued by the entire Luftwaffe, or so it seemed.

By May 25th, Fallschirmjäger-Regiment 3. in the valley south of Canea had been revived by the arrival of Gebirgs-Regiment 100. and together they launched themselves against Kippenberger's ersatz infantry on the Galatos heights. The pressure was irresistable and the Germans finally occupied the town. Kippenberger, however, managed to hold a line north of the village by throwing in the 4th Brigade Band and the Kiwi Concert Party as infantry. More help was on the way. From the 3rd Hussars, the irrepressible Farran, who had acquired another tank in the interim, arrived with two light tanks. At 1700, he led a brief reece into the town, which developed into a sharp fire fight with Germans concealed in the town. The tanks sprayed the buildings with machine gun fire and then withdrew to report the place "stiff with Jerries".

In the meantime, two companies from the 23rd Battalion had arrived and Kippenberger decided to launch a counterattack immediately. When Farran returned, he was asked to join in the attack and immediately agreed. Two crewmen had been wounded during the foray into the town but there was no shortage of volunteers and the empty seats were filled with a pair of Sappers, Privates Lewis and Ferry, who were then given a ten-minute course in tank warfare which ended with a disquieting "Of course you seldom come out of one of these things alive." Then it was back into the town. Farran joined the two New Zealand companies on the road. Then, calling on the second tank to stay close, he slammed the turret hatch and started off. Behind, the infantry followed first at a walk, then breaking into a running charge. The tanks careened into the town at speed, spitting a steady stream of bullets at doors and windows. Behind them the New Zealanders broke into wild yells that could be heard across the valley. In the lead, Farran reached the town square. He had caught the Germans napping and drove around the square, firing continuously at anything that moved. Mortar shells commenced falling in the square just as the first of the infantry reached it. The second tank had been lost somewhere in the wild dash through the town and now a mortar shell landed on the rear deck of Farran's Mark VI., bringing it to a halt and wounding the young Lieutenant. As Farran lay in the street, the howling mass of New Zealanders rushed past him, bayonets fixed, driving the last of the Germans from the town.

X. The Rear Guard

The success at Galatos was not exploited in the face of the Luftwaffe's complete supremacy and the following day, Freyberg admitted that the battle was lost and arrangements were made for an evacuation from Sphakia on the south coast. Meanwhile, the three Matildas under Lt. J.F.G. Terry had arrived from Heraklion. The tanks with a force of commanders would provide rear guards for the withdrawal. The tanks left Suda on the morning of the 28th and helped "A" Battalion of the commanders fight their way through to the south. However, less than 10 miles from the port, two of them broke down and had to be abandoned. The one remaining Matilda positioned itself on the winding road north of the village of Bablai Hani. Here, with "D" Battalion of the commanders, Terry held a road block against Gebirgs-Regiment 85. At 2115, the rear guards withdrew to the next line. Somewhere along the mountain road, the last Matilda was abandoned.

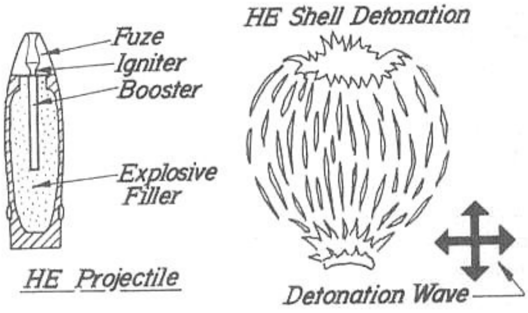
- Continued on Page 30 -

Behind the Armor versus Ammunition Contraversy (Continued from Page 11.)

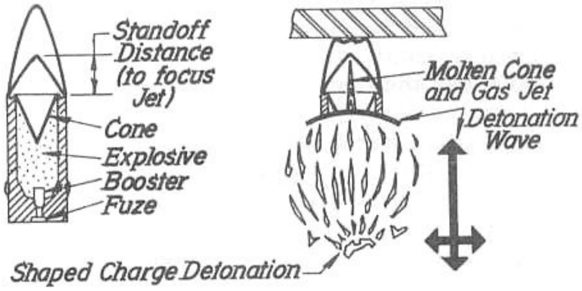
a scientist named Monroe late in the 19th century. Application of the Monroe Effect gave the military the shaped charge.

Drawings of both conventional high explosive and shaped charge rounds are shown in Figure 5. The action of the shaped charge is produced by the focused detonation wave which begins at the rear of the charge. As the wave moves forward, it picks up speed and energy, vaporizing the cone metal. The armor penetrating "projectile" is the resulting jet of molten metal and hot gases moving at almost 30,000 feet per second. Rounds of this type have been made for both infantry and artillery weapons - from the WW-II. bazooka to the French 105mm (of the AMX-30) which can penetrate 16 inches of Class 105,000 steel plate.

Figure 5.



Shaped Charge Projectile



The two keys to shaped charge weapon performance are keeping the round unrotated and nearly perpendicular to the face it is to penetrate. The charge portion of the AMX-30 round, for example, is mounted on roller bearings to prevent rotation caused by rifling. Keeping the projectile within a limit of 30° to the perpendicular eliminates glancing off and insures that the jet will be directed internally.

New developments have kept pace with advancing technology. The author has witnessed a demonstration where a shaped charge high explosive the size of a fountain pen penetrated 8 inches of heat treated steel plate. Charges have been merged with wire guided and homing missiles (the US Shellelagh) making the weapon even more devasting. All shaped charge weapons are generally classed as High Explosive Anti-Tank, or HEAT.

The speed of an explosive's detonation wave produces its shattering effect. This effect is known as brisance. Explosives having low brisance have more lifting/moving power. These types are used in regular HE shells. Explosives with high brisance have greater shattering power. Brisance affects materials in different ways: tough materials will pass high brisance relatively unaffected while low brisance destroys them; soft materials bend under low brisance to regain their shape after the wave passes while high brisance shatters them.

Eliminating an AFV as a fighting unit by destroying its soft insides - the crew - is the function of a special high brisance weapon. Because the weapon has a relatively high energy output, it is called High Energy Anti-Tank, or again, HEAT. This round detonates outside a vehicle which seems to concentrate the brisance on the crew inside. Soft, living material, particularly nerve tissue, is disrupted by the shock wave. . . death being almost instantaneous. In this way, a tank may be removed from battle with little or no physical damage.

The final explosive device to be presented here is one which goes under the name High Energy Plastic, HEP. There are several varieties of this round. All have the basic action of sticking to the target upon impact, heating the armor, followed by a detonation that blows molten/solid armor into the AFV compartment. Upon impact, the round usually welds itself to the target using a specially designed explosive collar. Armor heating may be done in several ways. Easiest to use is thermite (a mixture of aluminum metal and iron oxides) or white phosporus. A plastic explosive, hence the name, of relatively low yield is the more modern choice. Finally, a detonating explosive to the rear of the charge buckles the heated armor. Such a weapon was the WW-II. German Panzerfaust. In addition, HEP artillery rounds have been issued for howitzers of 75mm on up in size.

These developments in projectiles, in particular, High Energy and High Explosive Anti-Tank rounds, have greatly surpassed armor advantages. No modern armor, whether spaced or honey-combed, aluminum or steel alloy, is guaranteed proof against these weapons. Such a realization could be the reason behind such weapons systems as the M-551 Sheridan. Perhaps now, with offensive killing ability so far ahead, it is time to replace the slow, highly armored, easily hitable battle tank with a more versatile, lightly armored, evasive weapon. Only the test of tank/anti-tank combat will provide the answer.

Author's Resources Continued on Page 29.

The North African Desert Campaign Bibliography (Continued from Page 18)

6. von Mellenthin, F. W. (Generalmajor), Panzer Battles (Cassel & Co. Ltd. London, England, 1955) (University of Oklahoma Press, Norman, Oklahoma, 1956, 383pp, 28 ill.) HB-IP, PB-IP

This book traces the World War II. career of General von Mellenthin, a German General Staff officer with much experience on the Eastern Front and in the Desert, where he served as Rommel's Ic (Intelligence Officer) and later as Ia (Operations Officer). He gives much personal insight into staff operations of the DAK in the long desert section of the book (which is almost 100 pages). This book is a must for all persons interested in armored operations on the Eastern Front (during 1943-45) and the coverage of the Desert War is excellent for a picture into Rommels Field Headquarters during the critical battles of 1941-42.

7. Jewell, Derek (Editor), Alamein and the Desert War (Sphere Books Ltd. London, England, 1967, 208pp, numerous illustrations and maps) (Ballentine Books, Inc., New York, NY, 1968) PB-IP

This book is a most interesting anthology of short articles on the Desert War, written by some 15 different authors, including Field Marshall Montgomery. It is loaded with unusual photographs, and the coverage includes material on uniforms (in color), badges, the famous ballad "Lilli Marlene", Desert newspapers and much more. It is invaluable as a guide to what life was like in the Eighth Army, with photos and material not available from any other source, with an unusal look into British Army life.

8. -------, Balkankreuz über Wüstansand (Gerhard Stalling Verlag, Oldenburg, Germany, 1943, 159pp, 99 ill., mostly in color) HB-OP

Authored by a Luftwaffe Kriegsberichter-Kompanie (War Reporter Company) of the DAK, this book covers the Afrikakorps in photos, mostly in color! Naturally, considering the authorship, a good deal of the content covers the activities of the Luftwaffe, including a color photo of Hans Marseille and several of Bf-109 fighter aircraft. For the armor buff, there are several photos of Pz.IV.'s in color and several action photos from the early days of 1941. Two really beautiful photos (in color) of Feldmarschall Rommel top the volume off. This is one of the really rare books on the DAK, but some copies are still around if you're a real collector and know where to look.

To be Continued

Behind the Armor versus Ammunition Contraversy (Continued from Page 28)

RESOURCES: The material in this article is condensed from chapters in two forthcoming books by the author, Wargamer's Resourcebook and Winning Wargames. Sources used are:

1. K. Macsey and J. Batchelor, Tank, New York, NY
2. "Materials Engineering", Materials Selector, Mid-October Issue, 1968
3. International Nickel Co., Properties of Some Metals and Alloys
4. Departments of the Army and Air Force, German Explosive Ordnance, Washington, D. C.
5. U.S. Department of Defense, Ammunition, General, Washington, D.C.

The Defense of Sicily...... Conclusion (Continued from Page 23)

been acquired by the units of the division; these were camouflaged with Wehrmacht license plates (!) to prevent the Italians from reclaiming them. In addition, Italian stragglers (mostly from the "Aosta" Division) had joined the division, preferring to fight under German command than under the inept Italian leadership. These men had been formed into a Panzer-Grenadier-Bataillon, with German officers and NCO's, and they preferred to stay in the German Army. As the "deutsche-italianische Pz.Gren.Btl.'Reggio'", they were to remain an effective part of the division in the fighting to come.

Although withdrawn from the island with reduced combat effectiveness, the 15. Panzer-Grenadier-Division had certainly lived up to the tradition established in North Africa by its predecessor. General Rodt had led his division with skill and courage, and the defense of Sicily by this German division established a sense of morale and eliteness among the division's members that was to live long after their withdrawal.

A Note on Sources: Although both the "Hermann Göring" Division and the 29. Pz.Gren.Division have published archives and histories, there has been little written on the history of the 15. Pz.Gren.Division, except for some records (in German) written by the Division Commander. It is hoped that readers will forgive some of my mistakes, in the hope that we can provide some material on an unusual German Army unit.

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Letters to the Editor

This may sound like a crank letter, but I'm sick of reading "rave" reviews on Tamiya kits. For example, the Tamiya Panther has been getting good reviews for years and there are obvious errors in the rear engine deck detail. The two rear small hatches (for gas intake?) are reversed from what they should be, and the hooks are not correctly placed. With a little green stuff and cutting, this can be corrected (see pp. 28 of the Feist Publication book Panther). On the Jagdpanther the small round rear ammunition hatch has a hinge that is all wrong as well. The Jagdtiger fails to consider that the rear idler wheel was moved back on the "hunting" version from where it was on the Tiger II.

The Kübelwagen for some unexplained reason has the inside detail on the front wheels, while leaving the rear wheels simply hollowed-out (perhaps they expect to sell two for one to those crazy enough to scrap one to get the second one right). The Pzkw.III. has no screening on the air intakes and some detail is missing under the engine louvers, the smoke dischargers are awful, and the handle for opening the turret side hatches should be scraped-off and replaced by those from the Monogram Pzkw.IV., and the holders for the return rollers should be cone shaped. Most of us would have been happier with a Pzkw.III. E, F, G, or J and back converting is complicated by the difficulty in making the hinges for the front hatches on the earlier models. Both the III. and the StuG have rear rivet detail missing. The Pzkw.II. has non-rolling return rollers and it takes a hell of a lot of work to make them roll. The one-piece disaster they call the rear idler takes hours of painstaking labor to notch out. The tank also needs a screen over the muffler. The Tiger I. has about half as many wheels as are needed and since those provided are "poly" it is all but impossible to mend the error. Also the air filter detail leaves much to be desired.

The suspension systems of Tamiya tanks are not separate but are molded on in such a way that they stick out across part of the bottom plate. And then for bottom detail they give a bunch of holes for an electric motor! I'm surprised they didn't find a way to put an electric motor in the BMW motorcycle! If I can spend hours crawling under tanks getting chigger bites while recording bottom detail, why can't they? Tamiya is a good company but nothing they make should go unscrutinized. Heavier criticism on our parts might make a change for the better in future kits.

R. McG.
Peoria, Ill.

Battered Hulks and Cockleshells (Continued from Page 27)

When the final retreat was ordered, Major Peck's Squadron still numbered three Mark VI. Lights. These were ordered to support the 19th Australian Brigade holding a final rear guard position at Imvras above the beaches, where an engineer detachment was preparing to blow-up the roadway. At 0500, the leading elements of Gebirgs-Regiment 100. launched an attack, supported by mortar fire, which disabled one of the tanks. The Germans, however, could make no headway against the remaining tanks and Bren carriers. At 1100 hours, word came through for the rear guard to retreat to the beach for evacuation. The two tanks were destroyed and eleven officers and men were embarked on the destroyer H.M.S. Napier. The Battle for Crete was over.

The Historian's Notebook (Continued from Last Issue)

There are many ways to take notes on resources, but of the many methods used the above has been professionally accepted with good reason for many years. I recommend it as an alternative organization method with these reminders. Always quote directly, delete words if you want with three dots (. . .) where useful, but quote exactly, so that any errors in the author's writing, spelling style, etc. will be his, not yours. Also so that you will not unwittingly break copyright laws. Secondly, NEVER abbreviate in direct quotes unless the quote does so that you will KNOW later what you meant and how it was initially said.

One last point. If you are writing an article or a chapter, arrange the cards topically to suit yourself and if you want to number their order (which will change as you add more information) you can do this in the upper left corner in pencil, to be erased when the paper (article or chapter) is completed.

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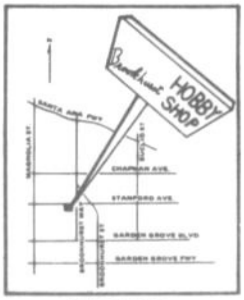

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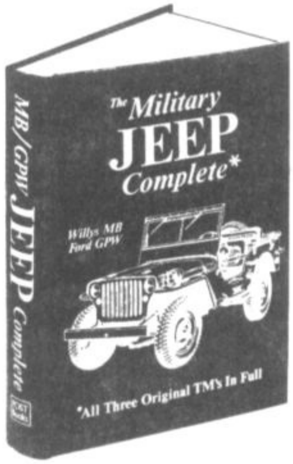

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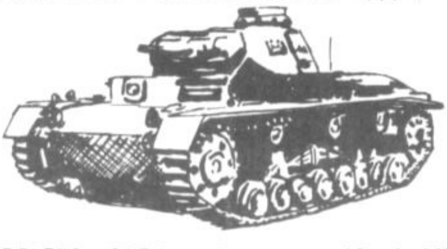

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